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USSR Report

CHEMISTRY

No. 81

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Chemistry

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ANALYTICAL CHEMISTRY

UDC 543.064:546.791:547.775

INVESTIGATION OF COPRECIPITATION OF MICROQUANTITIES OF URANIUM (VI) USING PYRAZOLONE ARYL METHANE DYES

Leningrad RADIOKHIMIYA in Russian Vol 23, No 5, Sep-Oct 81 (manuscript received 27 Aug 80) pp 633-635

CHELNOKOVA, M. N. and GERTSEN, T. A.

[Abstract] The study showed that it was possible to use acid stable reagents such as pyrazolone aryl methane dyes (PAMD) to coprecipitate microquantities of uranium (VI) from solutions. In this particular case, excess ammonium thiocyanate was added, to convert the element to a complex anion $[Me(SCN)_n]^{m-}$; PAMD then served as the cation. Optimal conditions were established for precipitation of uranium: solution acidity, concentration of thiocyanate ions, dye concentration, etc. The following dyes we were studied: 4'4"-tetramethyldiaminodiphenyl-3-methylpyrazolone-5-yl-4-methanol, its 4',4"-tetraethyl homologue, 4'-dimethylaminophenyl-4"-methylbenzylaminophenyl-1-phenyl-3-methylpyrazolone-5-yl-4-methanol, 4'-dimethylaminophenyl-4"-dimethylbenzylaminophenyl-1-phenyl-3-methylpyrazolone-5-yl-4-methanol. Total extraction of the element was achieved with considerable excess of the dye. The PAMD studied exhibited a range of effectiveness: chrompyrazol-I and chrompyrazol-II appeared to be most effective and were recommended for use in concentration of microquantities of uranium out of acid solutions. Figure 1; references 5 (Russian).
[47-7813]

UDC 546.799.3:546.791.02

COPRECIPITATION OF ^{239}Np WITH $BaSO_4$ IN TESTS FOR DETERMINATION OF URANIUM CONTENT

Leningrad RADIOKHIMIYA in Russian Vol 23, No 5, Sep-Oct 81 (manuscript received 13 Jun 80) pp 636-641

ADAMEK, A., POPEKO, A. G. and CHUBURKOV, Yu. T.

[Abstract] The barium sulfate coprecipitation method was used to assay uranium content in many natural samples with varied chemical composition. The most thorough analysis was formed on the meteorite Allende (obtained from the Smithsonian collection). The method was based on an activation-radiochemical analysis of the isolated neptunium-239 which is formed directly from uranium-238. Comparative analytical data are reported for the instrumental, radiochemical and trace analytical methods. Figures 3; references 14: 8 Russian, 6 Western.
[47-7813]

UDC 669.882;621.039.325

UTILIZATION OF AMINOPHOSPHORIC ACID AMPHOLYTES OBTAINED ON POLYACRYLATE BASE FOR SEPARATION OF URANIUM FROM ZIRCONIUM AND BERYLLIUM

Leningrad RADIOKHIMIYA in Russian Vol 23, No 5, Sep-Oct 81 (manuscript received 26 Aug 80) pp 647-651

PAKHOLKOV, V. S. and RYCHKOV, V. N.

[Abstract] In continuation of preceding studies, experimental data have been gathered on the adsorption of uranium, beryllium, and zirconium ions from the solutions of $UO_2F_2(BeF_2, ZrF_4)$-NH4F-H_2O by the aminophosphoric acid ampholyte ANKF-80, in the H^+Cl^- form. The experiments were performed at room temperature. Optimal conditions were determined for the separation of elements. It was shown that nitrogen-containing ampholytes formed on polyacrylate base may be used in separation and concentration of uranium out of fluorine-containing solutions and in its isolation from other impurities. Figures 3; references 13 (Russian).
[47-7813]

UDC 546.791.4 + 541.49

EXISTENCE OF $U^{(IV)}$ FORMS IN FLUORIDE SOLUTIONS

Leningrad RADIOKHIMIYA in Russian Vol 23, No 5, Sep-Oct 81 (manuscript received 26 Jul 80) pp 666-672

BORIN, L. L. and KONEVA, L. G.

[Abstract] A series of binary salts forms in systems consisting of uranium tetrafluoride, alkali metal or ammonium fluorides and water. It was of interest to compare the solid phase complexes with those in water solution in an equilibrium state. Knowledge of the composition at such equilibrium is also needed for calculations of chemical potentials and of the activity of salts in such solutions. Using literature data on the values of the concentration constants of formation of complexes of $U^{(IV)}$ with a fluoride ion, and the equations of Vasil'yev, Davies and Van Panthaleon-Van Eck, thermodynamic and concentration constants were calculated when the ionic strength of the solution is I= 0.12. The results showed that the yield of complexes with even number of fluoride ions was higher than that with a number of F^- ions. The concentration of fluoride ion corresponding to maximal fraction of various complexes was the following (complex, concentration in mole/1 being reported): UF_2^{2+}, $5\cdot10^{-6}$; UF_3^+, $7\cdot10^{-5}$; UF_4^0, 10^{-3}; UF_5^-, $8\cdot10^{-3}$ and UF_6^{2-}, $5\cdot10^{-1}$. The tendency of $U^{(IV)}$ to form anionic complexes is also exhibited by the formation of binary fluorides and in the ability of UF_4 to be adsorbed by the fluoride form of an anion exchange resin. It was shown that an increase in F^- ion concentration leads to higher yields of the ionic complexes because of increased concentration of the anion and due to higher complex formation constants. Figures 3; references 32: 22 Russian, 10 Western.
[47-7813]

UDC 546.791.6

DIOXOURANIUM (VI) CARBOXYLATE COMPOUNDS WITH MONOMETHYLAMINE

Leningrad RADIOKHIMIYA in Russian Vol 23, No 5, Sep-Oct 81 (manuscript received 4 Jul 80) pp 673-677

MAZO, G. N., SANTALOVA, N. A. and DUNAYEVA, K. M.

[Abstract] Reactions of dioxouranium(VI)carboxylates UO_2A_2 (A= $HCOO^-$, CH_3COO^- and $C_2H_5COO^-$) with gaseous CH_3NH_2 were studied. Elemental X-ray phase and thermal analyses of the products $UO_2A_2\cdot2CH_3NH_2$ were performed and their IR spectra were discussed. It was established that the complexes formed were thermally less stable than the parent compounds. The thermal decomposition process carried out under iso- and polythermal conditions in vacuum and in an inert atmosphere exhibited two endothermal effects at 310-420 and 500-570°K. Analysis of the products showed that along with the expected reaction products, hydroxy complexes were formed $UO_2(OH)A$, evidently due to a side reaction of ammonolysis. The

oxides formed in this thermal decomposition differed in their composition from the stoichiometric uranium dioxide. References 5 (Russian).
[47-7813]

UDC 548.736

CRYSTALLINE STRUCTURE OF $UO_2SO_4 \cdot 3CO(NH_2)_2$

Leningrad RADIOKHIMIYA in Russian Vol 23, No 5, Sep-Oct 81 (manuscript received 22 Sep 80) pp 678-681

SEREZHKIN, V. N., SOLDATKINA, M. A. and TRUNOV, V. K.

[Abstract] On the basis of literature data, a structure was proposed for tricarbamidosulfatouranyl (TCSU). It was stipulated that three oxygen atoms from the carbamide molecules would be located in the equatorial plane of uranyl ions as well as two oxygen atoms from two bridge sulfate groups. Depending on how the neighboring uranyl ions were connected--by two or by a single bridge anion--one could expect existence of dimers $[UO_2SO_4 \cdot 3L]_2$ where $L = CO(NH_2)_2$ or continuous chains $[UO_2SO_4 \cdot 3L]_\infty$. This paper reports study of the TCSU structure. It is shown that the TCSU consists of continuous chains propagating parallel to the a period. Comparison of crystalline structures of $UO_2SO_4 \cdot nH_2O$ with $UO_2SO_4 \cdot nL$ showed that all uranyl sulfate hydrates have analogous bond structure. In contrast to these hydrates, regardless of the ratio of UO_2SO_4:L, all uranium sulfate carbamides are coordinated through the uranium atoms. Figure 1; references 8: 5 Russian, 3 Western.
[47-7813]

UDC 542.61.661.879:663.635

EXTRACTION OF MICROQUANTITIES OF URANIUM FROM CARBONATE SOLUTION

Leningrad RADIOKHIMIYA in Russian Vol 23, No 5, Sep-Oct 81 (manuscript received 4 Jul 80) pp 772-773

AFANAS'YEV, Yu. A., FROLOV, Yu. A. and TSEY, A. A.

[Abstract] Concentration of microquantities of uranium from carbonate solutions was studied. It was shown that the method based on the use of organic extraction agents with complex-forming additives may be applied to electrochemical extraction of dilute carbonate solutions. Benzyl alcohol with triethylamine chloride (TMA) was used as the liquid ion-exchange agent. Optimal conditions were: extraction time: 2 hrs, concentration of TMA: 0.1 mole/l. This method could be used to remove trace quantities of uranium from carbonate solutions and to obtain uranium-free sea water. References 5 (Russian).
[47-7813]

UDC 545.243:(546.841:546.791)

DETERMINATION OF MICROQUANTITIES OF THORIUM IN URANIUM BASED ON DIFFERENTIAL-KINETIC METHOD

Leningrad RADIOKHIMIYA in Russian Vol 23, No 5, Sep-Oct 81 (manuscript
received 11 Apr 80) pp 778-779

ALEKSANDRUK, V. M., NEMTSOVA, M. A. and STEPANOV, A. V.

[Abstract] Spectrophotometric methods for the determination of thorium mixed with other actinoid elements require rather complete separation of all impurities, which is a difficult process. The differential-kinetic variant permits accurate determinations of thorium even in presence of rare earth elements, Fe, Zr, and Hf. Residual uranium shows no effect on the determination of Th up to a 50-fold excess of uranium. The recommended range for thorium concentration in an analytical sample is 10^{-7} to 10^{-5} g of Th. References 5: 4 Russian, 1 Western.
[47-7813]

UDC 543.53+539.172.16):546.811.02

PRODUCTION OF CARRIER-FREE ^{119m}Sn FROM ^{116}Cd IRRADIATION WITH α-PARTICLES

Leningrad RADIOHIMIYA in Russian Vol 23, No 5, Sep-Oct 81 (manuscript
received 16 Dec 80) pp 783-787

BOGDANOV, R. V., NOVIKOV, A. A. and CHEREZOV, N. K.

[Abstract] The radionuclide ^{119m}Sn is widely used as the source of nuclear gamma-resonance (NGR) irradiation. However, it is difficult to obtain this element with high specific activity. As a matter of fact, ^{119m}Sn is not even listed among domestically-produced, spectroscopically-pure radioisotopes. The present study was aimed at developing a method to prepare carrier-free ^{119m}Sn based on α-irradiation of metallic Cd enriched with ^{116}Cd isotope. The irradiated sample was dissolved in HCl and purified through a DOWEX 1X8 anion exchange column; elution with 11 molar HCl first removed Cd and In. Sn was eluted with 0.1 molar HCl. It was found to be necessary to repeat this elution 4 times to achieve a 90% yield. In between each elution with 0.1 M HCl, the Sn complex had to be regenerated by passing 3 ml of 1 M HCl through the column. Sn was concentrated by evaporating HCl. The final product was carrier-free radioactive tin contained in 1 ml of 2 mole/l HCl. Figures 3; references 16: 5 Russian, 11 Western.
[47-7813]

CATALYSIS

UDC 541.127:547.582.3:547.1'118

SUPERSTOICHIOMETRIC DECOMPOSITION OF CUMENE HYDROPEROXIDE BY DIARYLPHOSPHOROUS ACIDS

Moscow NEFTEKHIMIYA in Russian Vol 21, No 5, Sep-Oct 81
(manuscript received 11 Nov 80) pp 728-734

CHERKASOVA, O. A., CHEBOTAREVA, E. G., GOL'DFARB, E. I., POBEDIMSKIY, D. G., MUKMENEVA, N. A. and KIRPICHNIKOV, P. A., Kazan' Institute of Chemical Technology imeni S. M. Kirov

[Abstract] Results are presented from a study of the kinetic regularities and mechanism of interaction of tert-butyl and cumene hydroperoxides with several phosphorous acids by the method of kinetic polarography. The reactions were conducted in chlorobenzene in the 20-100°C temperature interval. It was shown that catalytic breakdown of hydroperoxides is dominated by heterolytic decomposition without the formation of free radicals. The rate of decomposition is directly proportional to the concentration of the acid and to the square of the concentration of the hydroperoxide. Figures 2; references 13: 9 Russian, 4 Western.
[44-6508]

UDC 542.97:66.095.253

BIFUNCTIONAL CATALYSTS FOR ALKYLATION OF BENZENE BY ETHYLENE (REVIEW)

Moscow NEFTEKHIMIYA in Russian Vol 21, No 5, Sep-Oct 81
(manuscript received 17 Nov 80) pp 773-794

ISAKOV, Ya. I. and MINACHEV, Kh. M., Institute of Organic Chemistry imeni N. D. Zelenskiy, USSR Academy of Sciences

[Abstract] This article is a review of the Soviet and western literature on the subject. Most polyfunctional catalysts are two-component compositions such as metal-acid oxide, metal-amorphous aluminosilicate, metal-zeolite, having the properties of solid acids. This report summarizes results relating to nickel-containing systems designed for use in processes of alkylation of aromatic compounds by ethylene. On the example of nickel-zeolite catalysts, it is demonstrated that the range of catalytic systems with polyfunctional effect is not limited to metal-acid oxide (aluminosilicate, zeolite) compositions. In some cases,

bi(poly)functional properties may be manifested by single-component catalysts. The "functional nature" of heterogeneous catalysts is not always determined by the number of components and may depend significantly on the nature of the process and the conditions of application as well. This study demonstrates the variety in methods of regulation of catalytic properties in zeolite systems and the great capabilities for their use in organic synthesis. Figures 7; references 69: 49 Russian, 20 Western.
[44-6508]

PRODUCTION LAG AT RUSTAVI CHEMICAL PLANT REPORTED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 16 Oct 81 p 3

[Article: "With the Help of the Ministry"]

[Text] Idle times, high accident rate and slow assimilation of new capacities were named among the basic reasons for unsatisfactory work of the Rustavi Chemical Plant in an article titled " We Name the Lagging Plants." It was printed in SOTSIALISTICHESKAYA INDUSTRIYA of 17 July 1981.

In its answer to the editors, the deputy chief of the association Soyuzazot V. Istratov reported that the article was considered at the Ministry for Mineral Fertilizer Production and the criticism toward the enterprise and Minudobreniy [Ministry for Mineral Fertilizer Production] was justified. The lag of the plant was caused mainly by idle times of the nitric-acid-ammonium nitrate complex.

After the newspaper article, Soyuzazot and Minudobreniy implemented operational measures to improve the operation of the complex. A new gas-turbine unit was ordered and manufactured for it. It has now been assembled at the plant and its hot running-in is being completed. A total of 45 of the best installers from related enterprises has been allocated for Rustavi every month to participate in installation and testing of the equipment. The chemical workers plan to bring the unit to design load during the fourth quarter with their assistance. This will permit a significant acceleration in assimilation of new capacities for ammonia and nitrogen fertilizer production.

At a meeting of the board of Minudobreniy, the director of the Rustavi plant G. Gogoladze warned about the need to increase demands on engineering and technical personnel and to adopt effective measures to reduce idle times of equipment and to accelerate its introduction to design capacities. Chief engineer Z. Kervalishvili was reprimanded for omissions in technical management of the enterprise.

An answer has been received to the publication from the plant director G. Gogoladze and the secretary of the party committee Yu. Machavariani. They reported that a frank conversation about the reasons for the lag was held among the most active party and economic workers of the enterprise, the developed situation was analyzed and specific measures were planned to improve operation for each shop and plant.

Among them are to ensure stable operation of the nitric acid-ammonium nitrate complex, a clear schedule of routine and preventive repairs of basic equipment, in which the installation organization Gruzglavmontazhspetsstroy [Expansion unknown] will assist them. Experienced workers and daring organizers have been directed by the administration and party committee to strengthen management of the most complex sections. Jointly with Minvuz [Ministry of Higher Educational Institutions] and the State Committee for Vocational and Technical Training, measures have been implemented to supply the plant with personnel.

Capital repair of the enterprise was completed at the end of September and it is being provided with a stable supply of raw material. The adopted measures permitted the collective to improve work and to fulfill the September production program.

6521
CSO: 1841/25

POLYPROPYLENE AND METHANOL PRODUCTION AT TOMSK

Moscow EKONOMICHESKAYA GAZETA in Russian No 27, Jul 81 p 9

[Article: "Methanol Production is Waiting Its Turn"]

[Text] Not only polypropylene production must be completed this year but installation of equipment for the methanol shop with capacity of 750,000 tons must also be turned over during the third quarter. The brigades of general contral SMU-11 [Construction-Administration Installation] and SMU-1 of the Tomskkhimstroy Administration are working here on a shock schedule. The brigade contract is being used. Operational control of quality has been organized.

The day is approaching when the installers will arrive at the methanol site. Is everything ready to receive them? Provision of the construction project with preassembled pipe is cause for concern as before. An experimental plant was created at the Prommekhanomontazh Trust [Expansion unknown] four years ago to produce them. Thousands of tons of pipelines have come from here to the polypropylene complex and unfortunately with a long delay. The situation is being improved slowly. The process of manufacturing pipelines for methanol production requires twice as much time. Moreover, the customer--the directorate of the chemical plant--is drawing out the issue of orders and specifications for manufacture of this complex product. Until now the plant does not have its own production areas, leasing buildings that are hardly adapted.

Neither Prommekhanomontazh nor the general contractor--the Khimstroy Administration --are showing the proper concern about improving the work of the plant. The shops have neither been heated nor electrified. There are not enough gantry cranes in them and normal conditions for work and rest have not been created. The situation must be corrected on an urgent basis.

6521
CSO: 1841/25

PRODUCTION OF PLASTIC ARTICLES FROM INORGANIC AND ORGANIC COMPOSITES

Moscow IZVESTIYA in Russian 16 Oct 81 p 3

[Article by B. Konovalov, Scientific Reviewer for IZVESTIYA: "Norplasts--What Do We Know About Them"]

[Text] Regardless of how paradoxical it is, not having succeeded to flower as it should have, polymer chemistry is threatened with a decrease. Polymers forced out traditional materials, won wide recognition among users due to their excellent qualities and it seemed that they had a sunny future in front of them. But alas simultaneously with the victory march of polymers, a process proceeded rapidly throughout the world that undermined the position of plastics: the initial raw material--petroleum--became more expensive.

If one takes into account that approximately 3.5 tons of gasoline (and accordingly three times more crude petroleum) are required to produce one ton of polymer, it then becomes clear that the "foundation" of polymer chemistry is unstable. But can it be strengthened? For example, can coal and gas be recruited as a raw material or can one attempt to expend less petroleum to produce polymers?

A group of Soviet scientists headed by Academician N. S. Yenikolopov was engaged in this problem. They decided to develop composite materials, combining an organic polymer with inorganic additives, of which there are more than enough on the earth. Polymer composites were not in themselves anything new. Everyone knows, for example, rubber that is reinforced and intensified with soot. Glass-fiber reinforced plastics, where the polymer resin was reinforced with glass fibers, gained wide popularity. There was also the technology of mechanical mixing of powder-like polymers and mineral fillers. But articles made from these materials are brittle and the degree of filling does not exceed 15-20 percent.

Soviet scientists posed themselves a more daring problem--to achieve a degree of filling 30, 50 percent and even higher and ideally to generally transform the polymers to a "glue" that binds the inorganic materials.

Several years ago a method of producing composite materials during synthesis of polymers itself was developed at the Institute of Chemical Physics, USSR Academy of Sciences, under the supervision of Academician N. S. Yenikolopov. In this case the filler and the polymer are chemically bound to each other. This bond is very strong and one can achieve a high degree of filling of the organic material with inorganic material. Composites and articles from them have already been developed where the content of inorganic additive comprises 50 percent.

The method of chemical "grafting" of inorganic molecules was developed for so-called thermoplasts, which comprise three-fourths of the total worldwide production of polymers. These are such widely known materials as polyethylene, polypropylene, polyvinyl chloride, polystyrene and other materials which are now produced in our country by the hundreds of thousands and millions of tons. And now, due to the discovery of Soviet scientists, one can essentially double the production of polymers with the same expenditure of initial crude petroleum, using the same machines for synthesis of polymers and comparatively low capital expenditures for additional equipment required to prepare the inorganic additives. This will result in revolutionary transformations in polymer chemistry.

Nikolay Sergeyevich Yenikolopov called the new polymers "norplasts," which is an abbreviation of the long precise name: inorganic-organic plastics. The inorganic part plays a very important role in these materials. And not only because it replaces expensive organic chemistry processes. It turned out that the inorganic additives impart new valuable properties to polymers. The materials can be made stronger and more flexible, thermal conductivity can be increased and the necessary electrical engineering characteristics can be imparted. In short, the long-awaited capability of producing materials with previously assigned properties appeared in polymer chemistry. And this has no less important significance than the saving of expensive crude petroleum.

Norplasts have already gained wide recognition and the new direction has been formalized in an organizational manner for rapid and effective development. The main scientific management is retained by the USSR Academy of Sciences. And implementation of the basic ideas and development of new techniques have been entrusted to the new Scientific Production Association Norplast, created in the system of the USSR Minkhimprom [Ministry of the Chemical Industry] based at the Kuskovy Chemical Plant. The new All-Union Scientific Research Institute for Composite and Filled Polymer Materials--VNIIkompozit, contained within the NPO--has arisen on the territory of the plant.

Experimental production of norplasts has now been developed at the Kuskovy plant and the first tons of the new materials for testing in the most diverse national economic articles are being produced. The first shop for activation mechanical filling of polymers has already been prepared for starting up.

The technology of so-called polymerization filling opens up even wider opportunities. Here the chemical bond with the inorganic filler should be accomplished at the stage of polymer synthesis. The possibility of producing polyethylene with 30-percent kaolin additive was checked recently at the Gur'yev Chemical Plant. A total of approximately 20 rubles are expended to prepare one ton of kaolin (dry or pulverized matter) for chemical compounding. And each ton of the produced norplast yields approximately 150 rubles' saving! And the material is produced with better characteristics than the traditional material.

The Deputy General Director of NPO Norplast V. A. Teleshov shows one of the new articles to me--a crate for bottles--representative of a family of the same multiple packaging of which there is not enough in the country. An ordinary polyethylene crate stands alongside Viktor Aleksandrovich.

"Compare," he suggests.

The polyethylene crate in my hands is easily squeezed and the cells are compressed while the norplast crate is strong like steel. True, it is also heavier.

"True," confirms Teleshov, "our crate weighs 2.5 kilograms while the traditional crate of the Moscow Metal-Reinforced Plastics Plant weighs 1.9 kilograms. But ours consists half of peat fragments. This means that we save approximately 600 grams of polyethylene in each crate. This means that four crates rather than three as now can be produced on the same equipment with the same expenditure of polyethylene. This is not taking into account the new valuable properties of norplast. And it has a modulus of elasticity tenfold higher and has much greater strength. Having changed the dies for casting the crates, one can make the walls thicker and expend less material without reducing the strength characteristics. The service life of norplast crates, according to our calculations, should be twofold higher (especially in the southern regions of the country where polyethylene ages rapidly due to the effects of heat and intensive solar radiation). Moreover, norplast has better thermal conductivity, hardens rapidly and the duration of the production cycle for each crate has been reduced from 104 seconds to 72 seconds. This means that the productivity of the equipment is increased by 30 percent. This is what the use of mineral fillers means on a single specific example alone. Polyethylene is converted into a good structural material."

In one of the laboratories of VNIIkompozit, its head, Aleksandr Nikolayevich Zharov showed me his own type of "combine" for experimental production of norplast articles. Inorganic fillers and polymers can be mixed in it in different combinations, the mixture can be granulated and the necessary articles can be produced here by using a die or casting machine. Alongside is the laboratory equipment which makes it possible to investigate the characteristics of new materials and articles made from them. These articles are the most diverse types: caps for aerosol tanks, covers for electrical engineering equipment, storage battery containers--mass production enjoyed by millions of copies in the national economy. VNIIkompozit not only develops new materials, works out the technology for producing them and develops the equipment, but prepares the consumer markets for norplasts jointly with other organizations. And this is very essential because norplasts are an interagency product and can be used practically everywhere where plastics are used and can gain new spheres of influence.

Perhaps the most promising field of activity is now opened up to norplasts in reclamation. I was shown lightweight thinned pipes of norplast, capable of being wound onto a drum. Half of their composition is finely dispersed tuff-wastes of stone-cutting production, of which 50 million tons have now been accumulated in Armenia alone. These pipes should replace those now used in reclamation of ceramic clays. The current technique of reclamation is now as follows. A trench is first dug, segments of ceramic pipe are delivered to it, they are joined by hand and cemented and the drain ditch is then filled in. Polymer pipes permit a fundamental change of this technique and will sharply increase labor productivity.

VNIIvodpolimer [Expansion unknown], USSR Minvodkhoz [Ministry of Land Reclamation and Water Resources] is now testing equipment for laying polymer pipes near the Latvian city of Yelgava. An automatic land reclamation line has been assembled on three automatic machines. The drain trench is laid in a single continuous operation, the polymer pipe is produced directly on the site from granules and it is laid and the trench is filled in. After its passage, this complex combine leaves a field ready for use. In comparative tests, norplast pipes displayed higher qualities than polyethylene pipes. So that now this is a matter of mass use of a new technology.

"Chemistry is now faced with the tasks not only of developing new materials with the same or different properties but of doing this with minimum expenditures," says Academician Yenikolopov. "Norplasts are one of the bright manifestations of this trend. Petroleum must be replaced with mineral raw material and at that by local, least expensive raw material. Working jointly with different organizations, we are trying to find an effective mineral filler for norplasts in each region. This is tuff in Armenia, ash from shales precipitated in electric filters in Estonia, wood lignin in the Far East and in Siberia, kaolin in the Ukraine and the waste from phosphorite production on the Kola peninsula. The scientific potential must now be developed and techniques must be worked out so as to organize production of norplasts on wide scales as rapidly as possible. An entire program "Filled Polymers" has been developed at the USSR State Committee for Science and Technology. The interaction of more than 60 scientific institutions and industrial enterprises has been organized within this program. Our goal is to save petroleum. To replace organic materials with inorganic materials everywhere possible."

An enormous slab with the brave words of Dmitriy Ivanovich Mendeleyev: "The goal of science: foresight and benefit" hangs alongside the statues of Mendeleyev and Zelinskiy who worked here on the territory of the Kuskovy Chemical Plant. And Soviet chemists are true to his slogan. Foreseeing the difficulties which arise in the path of chemistry, they are seeking new paths for its successful development and are finding them.

6521
CSO: 1841/26

FIRST BATTERY OF ALTAYSKIY BY-PRODUCT COKE PLANT OPERATIONAL

Moscow TRUD in Russian 15 Dec 81 p 1

[Article by A. Gerasimov: "A New Plant in a New City"]

> [Text] Each year the first battery of the Altayskiy By-Product Coke Plant to go into operation will produce a million tons of coke.

Altayskiy has never yet witnessed such construction projects. And even the profile of the enterprise--ferrous metallurgy--is not traditional to the kray. We can say without exaggerating that the Altayskiy By-Product Coke Plant was built by the entire country. In the busiest time at the construction site, there were builders from Leningrad and Novosibirsk, Uzbekistan and Lithuania, and Georgia and Moldavia, and installers from Novokuznets, Lipetsk, Nizhniy Tagil, and Karaganda. And now the first tons of Altayskiy coke are being hoisted out.

A new city--Zarinsk--grew up simultaneously with the production facilities. Today it consists of blocks and blocks of multistory residential buildings with broad avenues and squares, stores, dining halls, schools and movie theaters.

"Our enterprise will make it possible to significantly reduce outlays on rail shipments," said plant director A. Kotovich. "Coal from the Kuznetsk Basin, on being transformed here into coke, will travel straight through to the metallurgical centers of Central Asia."

Compared to other kindred enterprises, the Altayskiy By-Product Coke Plant contains a number of innovations having the purpose of raising labor productivity and improving working conditions. As an example the battery's coke machines are highly mechanized and automated. Computers calculate the temperature and hydraulic conditions.

Not only metallurgists but also rural laborers await the plant's products. Spent coke-oven gas scrubbing facilities will work together with a granulation shop to produce high quality fertilizer.

An extensive environmental protection program has been foreseen. The giant combine must not do harm to Altayskiy Kray's virginal natural environment. The production processes employed permit full waste recycling. Wastes will be returned from a special utilization department into the coking charge. A water recycling system excludes the possibility that contaminated industrial effluents could be dumped into water basins.

The first battery has gone into operation during the present five-year plan. And next door a second battery is being built, the foundation pit for a third is being prepared, and space for a fourth has been marked out. There are few batteries in the country with an annual production of a million tons, but in the future there will be batteries with even greater output capacity at this site.

The city will grow together with the plant. During the current five-year plan we are to build 300,000 square meters of living space, schools and nurseries--in a word, all that is required for the normal life and leisure of the plant's builders and workers.

11004
CSO: 1841/58

BUTADIENE PRODUCTION AT PRODUCTION ASSOCIATION ORGSINTEZ

Moscow EKONOMICHESKAYA GAZETA in Russian No 29, Jul 81 p 12

[Article: "The Production Association Orgsintez"]

> [Text] New capacities of the chemical enterprises at Sumgait, including those at the Production Association Orgsintez, have been created by the plan of the 11th Five-Year Plan. It was decided in August to start up ahead of schedule the second unit of the butadiene production complex--one of the types of raw materials from which high-quality synthetic rubber is produced at the adjacent SK plant. The secretary of the party committee A. G. Dzhafarov talks about preparation for fulfilling the planned task:

A few days ago the party committee of the association routinely checked the course of fulfillment of adopted pledges. They discussed in detail how things are going at the complex, what the readiness is for starting-adjusting operations and when the training of qualified personnel will be completed.

The first butadiene production unit was put into operation in October of last year and our collective achieved its design capacity ahead of schedule in January of this year. Relying on accumulated experience, we plan to compress the deadlines for startup and achieving the design capacity of the second unit of the complex to the maximum extent.

The party committee keeps the work schedule under strong control.. We are increasing responsibility primarily of the main specialists of the association. The party committee meeting was preceded by a check of the situation at the facility through the efforts of the most active party workers. The overall pattern makes us confident that the adopted pledge will be fulfilled. During the discussion the party committee pointed out some omissions to the individual main specialists and managers of the services and recommended that a number of additional specific measures be implemented.

Information about preparations for startup comes into the party committee every day. If party assistance is required, it is rendered immediately. We contribute in every way to dissemination of the experience of those workers and engineers who demonstrate examples of a creative attitude toward the matter.

Low-octane motor vehicle gasolines of marks A-66 and A-72 will be forced out by fuels of marks A-76 and AI-93 with startup of the new production complex. I would like to emphasize that they have been certified for the state emblem of quality. The engine life of engines will be increased and the specific consumption of gasoline will be reduced when this fuel is used. And one more thing: we have stopped production of leaded gasoline for motor vehicles and perhaps the environment will become cleaner.

That which has been done is primarily the efforts of the petroleum refiners who service the new installation. I will name the senior operators P. Amanov, M. Semenov, R. Khadzhayev and A. Denisov. The party organization has sent tens of the best petroleum refiners here. Until now they had worked at modern enterprises and had mastered complex production processes.

It was required to provide good raw material for the reforming installation as well as stable quality. An automated production process control system for preliminary refining of petroleum based on Elektronika-60 microcomputers has been equipped for the first time in our sector. Whereas these ASUTP ordinarily operate in the "advisor" mode to maintenance personnel, the Elektronika-60 immediately controls 15 production parameters.

We then organized operational calculation of the mixing formula (so-called compounding) of motor vehicle gasolines by means of computers. The cost of each brand of motor vehicle gasolines is checked daily.

The collective of the new installation is learning to be thrifty at the same time. A total of 7 percent of fuel, 6.6 percent of thermal power and 2.7 percent of electric power was saved during the first half of this year. "Keep on the same way even further!" is the slogan of the competition among petroleum refiners.

[Translator's note: Parts of article are missing]

6521
CSO: 1841/26

CONSTRUCTION OF ALMALYK CHEMICAL PLANT PROCEEDS ON SCHEDULE

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 21 Nov 81 p 1

[Article by G. Zazvonov: "...And Then We Will Hear the Command 'Start Her Up!'"]

[Text] Leading a tour of his facilities--an oxygen producing complex, the director of the Almalyk Chemical Plant noted, not without satisfaction:

"The builders began work in spring, and now installation of the equipment is proceeding at full speed. Soon we will obtain our first tons of oxygen, making us no longer dependent on former suppliers in Samarkand, Chardzhou, Balakovo, and Dzhambul. They often let us down. Introduction of the new complex will eliminate the need for long-distance shipments. Our enterprise will begin working more rhythmically, and production will increase by 665,000 tons of mineral fertilizers."

The facility is being erected by collectives of the Uzbek SSR Ministry of Construction and the union and republic ministries of installation and special construction work. The success was predetermined by business-like and creative cooperation between the general contractor--the"Uzbekshakhtostroy" Trust--and associated enterprises.

Use of new construction techniques is accelerating the forward movement. Thus recently A. Vlasov's team from the "Uztal'konstruktsiya" Trust received a bonus from its administration: Using a gradual build-up method construction workers assembled a 180-meter exhaust stack ahead of schedule. The assembly operations were done on the ground. Then the finished parts of the stack were raised one at a time by special cranes. The entire stack was assembled in this way.

Consistent satisfaction of socialist pledges is accelerating the work. Collectives led by V. Poyarkov and V. Lavrov completed the hardest job of assembling the heat exchanger a month ahead of schedule. Their work was very painstaking. There are almost 3,000 pipes with a diameter of about 60 mm within the machine unit. Each had to be cleaned, carefully laid in place and rolled in precisely.

Nor are the Komsomol youth collectives lagging behind the veterans. Komsomol members of the Kibray Mobile Mechanized Column of Specialized Trust No 93, Uzbek SSR Ministry of Installation and Special Construction Work distinguished themselves at this construction site. Their job was to install chemical water purification equipment: oxygen and alkali containers and water purification filters. The total weight of the machine units exceeded 500 tons.

This equipment is usually installed in a finished building, but this always causes problems because there are no lifting mechanisms in such a building. Therefore the members of O. Suslyayev's and Yu. Dmitryak's teams suggested changing the construction technique--first installing the containers and filters and then erecting the building frame over them. The leaders of the construction project supported this initiative. As soon as the foundations laid by A. Goloborod'ko's team hardened, high-capacity lifting cranes were driven up to the construction site, and the work proceeded at full steam. The installers finished the building in a month, rather than the scheduled two and a half months. A. Vlasov's team maintained an intense rhythm, assembling the building frame ahead of schedule.

Each day the builders measure up their network schedule against the calendar. Just before start-up, time is reckoned by the hours. Things are perhaps "hottest" now at the location of the waste-heat boiler, which is to have a productivity of 60 tons of steam per hour. Specialists of the "Energometallurgmontazh" Trust are laboring here according to a sliding three-shift schedule. Yu. Sidorin, whose labor earned him the Order of Labor Glory, 3d Degree, is in charge of the enlarged 30-man team. As with their leader, all of the team's workers are schooled in associated occupations, and when necessary they can become welders, metal cutters, slingers and electricians. Such universality is necessary in the team--the requirements on assembly quality are very high. After all, the boiler generates a pressure of almost 500 atmospheres! The slightest carelessness, and the entire complex may have to be shut down. But up to now, fault detectors meticulously checking every joint have not reported a score any less than "excellent."

Speaking at the November (1981) Plenum of the CPSU Central Committee, Comrade L. I. Brezhnev focused attention on the fact that timely assimilation of production capacities is no less an important task than simply placing them into operation as fast as possible. Much depends now on the operators of the Almalyk Chemical Plant. Together with the equipment installers and adjusters, they must ensure a victorious finish for this hard-driving construction race, and then they must quickly raise the output of the complex to its planned productivity.

11004
CSO: 1841/58

TSKHINVALI LINENS FACTORY BEGINS PRODUCTION

Moscow EKONOMICHESKAYA GAZETA in Russian No 40, Oct 81 p 7

[Article: "New Factory Goes Into Operation"]

[Text] Georgian SSR. A new tricot linens factory produced its first in Tskhinvali. Outfitted with the latest Soviet and imported machine tools and equipment, the enterprise has a production area of more than 20,000 square meters.

Samples of the tricot articles which the new enterprise has begun producing earned a positive assessment from specialists at the All-Union Trade Fair. This is evident from the contracts signed at the fair: Orders placed by consumers will keep the Tskhinvali Tricot Linens Factory working for 2 years into the future.

11004
CSO: 1841/51

'MODEL' REFINERY ASSOCIATION DISCOVERED TO BE WASTEFUL

Moscow SOTSIALISTICHESKAYA INDUSTRIY in Russian 28 Oct 81 p 2

[Article by Inspector A. Mazitov, Bashkir ASSR Committee for People's Control, and Special Correspondent I. Payvin: "We Don't Need Any Inspections"]

[Text] Complacency has yet to be a benefit to anyone. As we can see, the executives of the "Bashneftekhimzavody" Association have not given any thought to this simple truth. They have long become accustomed to praise and to widespread recognition of their labor victories. Therefore when the Bashkir ASSR Committee for People's Control inquired as to their progress on planned measures for reducing the losses of raw materials and products and economizing on fuel and power, their answer was: "Don't you have anything better to do? It would seem clear that we don't need any inspections."

Special stubbornness was displayed by the association's chief engineer, N. Balitov, who argued the uselessness of an inspection with energy worthy of better applications.

"While the Ministry of Petroleum Refining and Petrochemical Industry makes an effort to publicize our good experience, you wish to blacken our name," he said with hurt feelings before the inspection and after its results became known.

In 5 years, the losses of raw materials and products experienced by just three petroleum refineries--the Refinery imeni XXII S"yezda KPSS and the refineries in Ufa and Novo-Ufimsk--were a million and a half tons, and consumption of raw materials, solvents, reagents and catalysts was excessive. No, this leakage did not occur through hairline cracks. It was discovered that much of the finished products and raw materials had simply evaporated from their containers. For that matter, there is no way that their contents could be fully preserved if, as an example, the technical rules of tank operation are violated in the way typical of the Refinery imeni XXII S"yezda KPSS: Each year the administration publishes orders requiring removal of light hatch covers, drainage of fluid from hydraulic valves and removal of the nonfreezing plates of breather fixtures for the entire winter. This is exactly what creates the conditions for a sharp increase in evaporation of petroleum and finished products.

How are such actions justified? The response is simple: Things run more smoothly this way; there is no need to monitor the condition of the containers or their contents.

It is not only when tanks are allowed to "breath" that thousands of tons of petroleum products are lost to the atmosphere. Other loss channels have not been completely blocked either, even though the enterprise executives often emphasize that this work is going on constantly and that reconstruction is being carried on with this purpose. But here are the facts. Fourteen units were subjected to reconstruction at the Novo-Ufimsk refinery. The resulting loss reduction was nil. Moreover the atmospheric exhausts of four of the units increased following their renovation.

The picture one is confronted with is now a matter of course: A train of tank cars is parked at the loading platform, and immediately they start pumping the gasoline in. The filling equipment is far from ideally leakproof. The fuel evaporates, and no one seems to care.

It is common knowledge in the association that the efficiency of the production furnaces does not exceed 65 percent. They have now been working many years without adjustment and without testing, using much more air than necessary. This is yet another avenue of loss, and no one seems to care about it any more either.

Now let us consider the use of gas. All three petroleum refineries of the Ufa group and the Ufa Synthetic Alcohol Plant, which is also within this association, burn off much more gas than normal. Not even the balance method is used to keep track of how much gas passes through the Novo-Ufimsk refinery. Five years ago a plan for remodeling the gas flare system was drawn up by this refinery, but various excuses have caused this work to be postponed. Now the All-Union "Soyuznefteorgsintez" Production Association has postponed the system's reconstruction to the next five-year plan.

The argument is often ventured that without the necessary equipment, it would be impossible to eliminate all losses through in-house resources. Let us assume that this is so. But, for example, who is keeping anyone back from standardizing the consumption of raw materials and power? In this area, the matter rests entirely in the hands of the local enterprise. But here is what the people's controllers discovered. With the knowledge and the participation of its director, M. Kukovitskiy, the Refinery imeni XXII S"yezda KPSS, in an effort to avoid extra trouble, developed petroleum product loss standards that would be advantageous to it. These standards remained in effect for several years. Neither the association nor the ministry paid any attention to this falsification. And so, what happened? Some time ago, on demonstrating a 3,000 ton decrease in losses in one of its reports, the refinery received a bonus, though what it really needed was not bonuses but reprimands and a demand to make up the difference.

Yu. Samodeikin, this refinery's deputy director for economic affairs and A. Repin, the chief of the planning division grossly violated the procedures for setting standards and keeping track of the losses of petroleum and products made from it. By altering the established reporting format they were able to cover up, as planned losses, a write-off of more than 9,000 tons in excess of the standard within 4 years.

There is also an unusual lack of concern toward the system of material incentives for reducing losses and for economizing on fuel and power. It seemed strange to hear, from the mouths of employees of the economic services of the Ufa refinery, that "this had not been foreseen." The bonus payment system at the synthetic alcohol plant and the Novo-Ufimsk refinery had not been reviewed for 5-6 years.

This of course reduces the interest of the people, resulting in insincere summarization of competition results. The entire effort is often boiled down to publishing orders that say nothing about how the fight to reduce losses is going on, and make no indications as to who is to blame for waste.

All of these unpleasant details had to be subjected to strict discussion at a meeting of the Bashkir ASSR Committee for People's Control. Those guilty of mismanagement got what they deserved. The Committee for People's Control made it known that it expected "Bashneftekhimzavody" Association Chief A. Yudayev and Chief Engineer N. Valitov to fulfill their promise of taking immediate steps to eliminate the violations and to improve the situation in the Ufa group of refineries. How well they keep to their word, time will tell. The committee has not closed this case yet.

11004
CSO: 1841/53

WASTE CADASTER PROMOTES WASTE RECYCLING IN STERLITAMAK

Moscow EKONOMICHESKAYA GAZETA in Russian No 42, Oct 81 p 12

[Article by Assistant Professor R. Khannanov, Bashkir ASSR Agricultural Institute: "According to the Cadaster"]

[Text] A group of specialists from the Institute of Chemistry of the Bashkir Branch of the USSR Academy of Sciences and the "Kaustik" Association in Sterlitamak introduced a scheme for utilizing polyamines in production waste. This made it possible to increase production volume by about 25 percent with the same equipment. Also successful is this association's efforts at producing ammonium sulfate--agriculture's most valuable fertilizer. This production operation is based on the use of spent sulfuric acid. More than 100,000 tons of acid have been processed since the production operation was started up.

This is only one example of how production wastes are being used at Sterlitamak enterprises. Tens of thousands of tons of raw materials--formerly thought of as wastes (irretrievable for that matter), are being recycled. The waste recycling efforts require the unified effort of producers and scientists. This program must be extended beyond the city: After all, that which has been discovered and introduced in Sterlitamak may also be useful in Ufa, Kuybyshev , Omsk and many other cities. After carefully studying the results of research on utilization of secondary resources, the city party committee proposed creating a cadaster of the wastes of chemical and petrochemical enterprises in the Sterlitamak industrial region. This was in fact done. The cadaster provides a classification of production operations serving as sources of secondary material resources, and it lists the resources themselves, their quantity, composition, the amount produced per ton of commercial products, the utilization method and so on.

The cadaster's data were obtained from an inventory of wastes conducted within the city limits. Irrespective of their departmental subordination, all interested organizations may obtain recommendations or completed developments for the production of finished commercial goods out of production wastes.

Of course, the cadaster must be systematically updated with new discoveries, developments and analytical data.

The experience of Sterlitamak tells us that the better part of unutilized wastes are valuable secondary material resources. Together with various sorts of discharged wastes, we lose expensive raw materials accumulated within them--petroleum hydrocarbons, coke, salt, chlorine and so on.

If sensible use is to be made of these materials, specific-purpose programs aimed at creating low-waste and wasteless production processes and stimulating enterprises that introduce the most effective waste utilization methods must be developed. Governmental legal support should be provided to development of waste cadasters, which have proven themselves to be an economically and ecologically profitable measure. In my opinion data contained in cadasters must be put to use in business practices.

11004
CSO: 1841/53

STEPS TAKEN TO IMPROVE WORK OF AUTOMATIC CASTING MACHINE PLANTS

Moscow EKONOMICHESKAYA GAZETA in Russian No 40, Oct 81 p 2

[Article by M. Gorodiskiy, Party Committee Secretary, "Avtolitmash" Plant: "The Lagging Sections Have Been Placed Under Surveillance"]

[Text] The "Avtolitmash" plant (Ivano-Frankovsk) was criticized in the review "Development of Machine Tool Building" (EKONOMICHESKAYA GAZETA, No 33) for failing to complete its semiannual plan. This is to report that the party committee and plant administration have thoroughly analyzed the work of the structural subdivisions (sections, services, shops). Practical ways to eliminate the existing shortcomings have been determined.

Thus a unit-by-unit schedule for producing machines and automatic lines covering the period to the end of the year was introduced. A bureau for the planning of technical preparations for production was organized, and the former system of operational production planning was reinstated. A standard method of accounting and evaluating the work effectiveness of production subdivisions was introduced. Rigid surveillance was imposed over the deadlines for planning and issuing design documents. The nomenclature of unified parts and units to be produced and stockpiled in anticipation of the demand was determined.

Questions associated with improving plant fulfillment were discussed at party and workers' meetings held in the shops and services. The party committee somewhat altered the structure of the primary party organizations and reinforced the party organizations of the leading shops.

11004
CSO: 1841/53

LEADING, LAGGING CHEMICAL AND PETROLEUM MACHINE BUILDING ENTERPRISES ANNOUNCED

Moscow EKONOMICHESKAYA GAZETA in Russian No 40, Oct 81 p 2

[Text] For successes in the 1980 all-union socialist competition on results of the 10th Five-Year Plan, the following associations were awarded the perpetual Red Banner and commemorative insignias of the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU and the Komsomol Central Committee, and their names have been entered on the All-Union Honor Roll of the Exhibition of the Achievements of the USSR National Economy: The Balashikhina Scientific-Production Association of Cryogenic Machine Building imeni 40-Letiye Oktyabrya, the Sumi Machine Building Production Association imeni Frunze and the Ural'sk Production Association of Chemical Machine Building imeni 50-Letiye SSSR.

The perpetual Red Banner of the CPSU Central Committee, the USSR Council of Ministers, the AUCCTU and the Komsomol Central Committee has been awarded to the following collectives: The Baku Oilfield Machine Building Plant imeni Montin, the Drogobych Drill Bit Plant in the All-Union Scientific Research, Planning and Design Institute of Petroleum Machine Building.

The following enterprises of the Ministry of Chemical and Petroleum Machine Building have fallen behind since the end of the year and have been unable to meet their targets in relation to the principal technical-economic work indicators: The Ruzayevka Chemical Machine Building Plant (Director, Comrade Surdolenko), the Sarapul Machine Building Plant imeni Dzerzhinskiy (Director, Comrade Korotayev), the Bobruysk Machine Building Plant imeni Lenin (Director, Comrade Nesterenko) and the Tula Association for the Production of Drive Units (Director, Comrade Danilin).

11004
CSO: 1841/53

DETAILS ON CHEMICAL, PETROLEUM MACHINE BUILDING DEVELOPMENT

Moscow EKONOMICHESKAYA GAZETA in Russian No 40, Oct 81 p 2

[Article: "Development of Chemical and Petroleum Machine Building"]

[Text] Chemical and petroleum machine building is supplying new equipment to a number of leading sectors of heavy industry. The associations and plants of the Ministry of Chemical and Petroleum Machine Building are manufacturing modern equipment for chemical, petroleum, gas, petroleum refining and petrochemical, pulp-and-paper and microbiological industry. Machines, assemblies and units are also being produced in response to orders from metallurgy, electric power engineering and agriculture.

The sector's workers increased production by 36.6 percent in the 10th Five-Year Plan. The profit from industrial activity almost doubled. Eighty-seven percent of the production increment was owing to higher labor productivity.

Scientific-technical progress was accompanied by growth in the unit power of the machines and machine units. The new, highly productive equipment includes, for example, complete production lines intended to produce 450,000 tons of ammonia per year. Production of primary oil processing units with a capacity of 6 million tons per year has been started. The world's largest air-fractionating unit producing 70,000 cubic meters of industrial-grade oxygen per hour has been manufactured.

In all during the 5 years, series production of 3,025 type-sizes of machines, machine units and production lines was assimilated. Concurrently deliveries of more than a thousand obsolete articles were terminated. The proportion of newly assimilated production was 50 percent of the total production volume.

Growth in the technical level of production at the sector's enterprises was promoted by full mechanization of 443 sections and by organization of 336 mechanized flowlines. The equipment pool was renovated: The proportion of machine tools with digital programmed control was increased. Twelve automated enterprise and production process control systems were placed into operation.

Much was done to improve working conditions and the life of machine builders. Capital investments permitted the ministry to build 1.4 million square meters of fully equipped housing space, to open new polyclinics, sanatoriums, children's nurseries and day care centers, and to broaden the dining hall network.

In the New Five-Year Plan

The tasks of chemical and petroleum machine building in the 11th Five-Year Plan were spelled out in the Basic Directions of the USSR's Economic and Social Development. The main task is to develop and assimilate production of the necessary amounts of progressive equipment and apparatus to support highly economic production processes in chemical industry, oil and gas extraction, petrochemistry, and pulp-and-paper and microbiological industry.

The targets of scientific-technical progress require the planning and manufacture of 4,000 experimental models, and assimilation of the production of more than 3,000 type-sizes of new equipment. At the same time about 900 obsolete articles are to be removed from production.

The sector's laborers are doing their part to increase extraction of Siberian gas as quickly as possible. The gas fields will be able to subject this gas to full processing when they receive modular automatic lines with a productivity of 10 million cubic meters per day. Gas pumping units driven by aircraft engines with a capacity of 16,000 kilowatts are being created for compressor stations along the main pipelines. These pumps can carry gas at a pressure of 76 and 100 atmospheres.

In order to hasten the development of oilfields and raise the effectiveness of their operation, collectives of the Kazan' Compressor Plant and the Bugul'ma Petroleum Machine Building Production Association will begin manufacture of highly prefabricated, ready-to-assemble modular equipment for gas-lift petroleum extraction. Production of other equipment to fit out oil and gas deposits is developing.

The Full Complement of Equipment for the Construction Sites

The volume of complete sets of progressive production lines and machine units (requiring subsequent expert assembly) and of modular equipment delivered to construction sites of fuel industry and other sectors increased by more than 1.8 times in 1976-1980. This trend will continue into the present five-year plan as well. Deliveries of complete sets of production lines, units and machine units will increase by another 25-30 percent. This will mean faster construction, assembly and assimilation of new production capacities. Rather than dealing with numerous supply organizations, plants need only work with the sector ministry's "Komplektkhimmash" Association. It bears the responsibility for the performance of all equipment.

Further development of such deliveries will depend to a significant extent on precise fulfillment of contracts signed by associated enterprises to deliver materials and outfitting articles. Some of these enterprises are violating the agreed deadlines. Cases have occurred in which enterprises of the Ministry of Chemical and Petroleum Machine Building itself have been late in manufacturing articles to be included in complex lines.

Production of fundamentally new high-tonnage heavy petroleum cracking units with a unit capacity of 2 million tons per year and their delivery as complete sets by a group of plants with the participation of the "Volgogradneftemash" and "Salavatneftemash" associations were organized for the first time in the current five-year plan. In all, petroleum refining and petrochemical industry is to receive 50 types of new equipment.

Experimental industrial plants producing synthetic liquid fuel are to be designed. Moreover outfits of equipment intended to process coal by the thermocontact coking method are being planned. The "Tambovpolimermash" plant is developing production of tire vulcanizing lines that will raise tire wear by 20 percent. The plan for new equipment includes manufacture of tire casting equipment and liquid molding equipment used to produce industrial rubber articles.

The creative efforts of the sector's scientific research institutes, design offices and enterprises are being directed at developing and assimilating highly productive, economical automated equipment requiring relatively lower amounts of electric power and fuel, and operating labor. The collectives of a number of institutes and the Sumi Association imeni Frunze have been ordered to build machine units for chemical production processes making use of the thermal energy of nuclear reactors and applying plasma physics and ultrasound, and new centrifuges for sugar industry. More-productive equipment for geological exploration is to be designed with a lower metal content.

Enterprises of refrigeration machine building will provide improved equipment to different sectors of the national economy. Mobile fruit storage facilities with a capacity of 80 tons are being created. They will keep fruit chilled at the picking sites and before transportation. Unified suspended refrigeration units are intended for refrigerator cars.

Taking advantage of the latest achievements of science and technology, the All-Union Scientific Research, Design and Technological Institute of Hydraulic Machine Building and the plants will improve the efficiency and all other operating characteristics of centrifugal pumps used to convey water, pure and contaminated chemical products and other fluids. The "Rigakhimmash" plant will deliver metering pumps with better leakproofing to medical, microbiological and chemical industry.

The current five-year plan is a time of production reequipment, mechanization of laborious processes and introduction of automated and specialized equipment as well as progressive production processes. A concrete example of this progress is organization of sections outfitted with automatic and semiautomatic lines and industrial robots. The technical level of the machines, units and machine units produced must be raised. The proportion of products with the State Seal of Quality must increase to 45 percent in 1985.

In order to raise production effectiveness and work quality, the ministry is now making preparations to reorganize the network of scientific research, design and technological organizations and to clarify their principal functions. There are plans for creating design and technological centers and an all-union industrial association to produce industrial equipment and gear and provide the appropriate production base. The ministry must make the work of scientific research institutes, design offices and enterprises planning new equipment more effective. There are still many weak points in their activity.

Reduce the Metal Consumption Norms

During the five-year plan, we must reduce the consumption norms for rolled steel by 21 percent and raise the coefficient of metal use to 0.75 from its 1980 level of

0.70. There is much work to do. Although the Ministry of Petroleum and Chemical Machine Building did manage to reach its target for economization of material resources on the whole in the past five-year plan, some enterprises and associations, including plants of the "Soyuzkompressormash" All-Union Production Association, tended to exceed the norms. Standardization is still unsatisfactory, metal is stored improperly, and it is being used wastefully.

The targets for the sector should be used as the basis for determining how much to reduce the metal content of specific types of products. Introduction of innovations into cryogenic machine building will reduce the metal content of high-tonnage air-fractionation units by 20-30 percent.

All of the subsectors are aware of the ways to reduce the metal content of equipment. Strict surveillance over efforts to reduce metal content must be established. A great role is to be played by introduction of the progressive experience of the enterprises, scientific research institutes and design offices. Thus machine builders of the "Kislorodmash" Scientific-Production Association in Odessa increased production by almost a time and a half in the past five-year plan while keeping rolled metal consumption at the 1975 level. Working according to a counterplan this year, the machine builders have pledged to achieve the entire increment in production (a little more than 5 percent) while keeping consumption of metals, fuel and electric power at the previous level, and without increasing the number of workers. The collective is sure to keep its word.

Actively participating in the all-union socialist competition, workers of chemical and petroleum machine building have surpassed the plan for 8 months of this year. They exceeded the production plan by 41 million rubles. The total production volume increased by 3.3 percent in comparison with the same period of last year. In this case 97 percent of the entire increment was achieved through greater labor productivity.

The targets for producing papermaking equipment, gas pumping units, gas-plasma apparatus and other articles have been surpassed. Deliveries of equipment to mineral fertilizer industry have improved.

However, there have been some setbacks in regard to the nomenclature plan. Deadlines for manufacturing machines, assemblies and units ordered by pilot construction projects have been violated. A significant quantity of enterprises were unable to complete the plan.

There is not much time until the end of the year. We must make sensible use of the available resources, organize distinct intrasector cooperation and intensify interaction with associated sectors at all levels.

11004
CSO: 1841/53

PLAN FOR CHEMICAL PETROLEUM MACHINE BUILDING DEVELOPMENT SUMMARIZED

Moscow EKONOMICHESKAYA GAZETA in Russian No 40, Oct 81 p 1

[Article: "Development of Chemical and Petroleum Machine Building"]

[Text] Workers of chemical and petroleum machine building are called upon to create and produce highly productive equipment in the 11th Five-Year Plan, to include equipment for fundamentally new production processes. In the last decade the enterprises of the Ministry of Chemical Machine Building have doubled their production of chemical equipment and spare parts. Production will increase by another fourth in the new five-year plan.

More than 3,000 type-sizes of new progressive equipment are to be placed into series production in 1981-1985.

Production and delivery of equipment for machine units with a high unit power is increasing significantly. They include gas pumping units with an output of 16,000 kilowatts to transport natural gas at a pressure of 76 and 100 atmospheres. Production of automated and modular equipment for oil and gas fields is increasing.

In the 5 years, the sector intends to reduce the consumption norm for rolled ferrous metals by 21 percent.

Enterprises of the Ministry of Chemical Machine Building are supplying highly economical, high-capacity machine units to petroleum, gas and petroleum refining industry. The top photograph [photographs not included] shows one of the electric desalinization units of an atmospheric-vacuum pipe still at a petroleum refinery. The photograph below shows a compressor station along the gas main originating at the Urengoy deposit, Tyumenskaya Oblast.

11004
CSO: 1841/53

BRIEFS

MINERAL FERTILIZER PRODUCTION--Having coped with the June plan for fertilizer production by only 30 percent, the collective of the enterprise (director G. Gogoladze) did not fulfill the six-month program as a whole. Since the beginning of the year a shortfall of more than 22,000 tons of products for the agricultural workers of Georgia and Azerbaijan and for the chemists of the Ukraine and the Russian federation has occurred. Nonuniform work, violations of production conditions, idle times of equipment and low product quality have become common here. Because of this and also due to overconsumption of raw material, fuel and electric energy, the enterprise is experiencing high losses which are calculated in the hundreds of thousands of rubles. Although the plant is fully supplied with personnel its managers complain of the absence of highly qualified workers of the basic occupations. Installation and adjustment of equipment for reconstruction of the enterprise is going on at insufficient rates and new capacities, for example, the ammonia production installation, are being assimilated extremely slowly. One cannot say that the Ministry for Mineral Fertilizer Production has not become alarmed at the fate of the lagging enterprise. Orders have been issued about its operation, leading specialists and entire committees travel to Rustavi and the plant is being assisted with raw material, materials, equipment and spare parts. But as shown by practice this assistance is clearly insufficient. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 17 Jul 81 p 3] 6521

UREA PRODUCTION--The first tons of urea have been produced at the new mineral fertilizer plant of the Association Permnefteorgsintez. It will produce approximately one million tons of high-quality granules annually. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 29, Jul 81 p 3] 6521

METHANOL PRODUCTION--The second unit of the plant--the largest producer of methanol required to produce plastics, synthetic fibers, rubber and other polymer materials --should become operational at the end of 1982. Installation of equipment at some facilities should be carried out at full tilt. However, the subdivisions of the USSR Minmontazhspetsstroy [Ministry of Installation and Special Construction Work] and primarily the unit of the Tomsk Trust Prommekhanomontazh [Expansion unknown] (Manager A. Shumskiy), are organizing very slowly. The installers have not fulfilled even one-fifth of the planned volume of work at the methanol site since the beginning of the year. Preparation of the facility for winter is especially lagging behind. Nevertheless, SMU [Construction-Installation Administration] No 46 (chief is P. Vyskrebets) will not succeed in installing the boiler plant for the building. The subdivisions of the trust have also gone off schedule in construction of a circulating water-supply system, reforming furnaces and laying of heating lines. The managers of the Prommekhanomontazh Trust as before are not devoting the necessary attention to methanol production while the customer--the directorate of the petrochemical plant--is not concerned about timely provision of the builders with complete parts for reinforced sections of pipes. It is time for the installers and operators to combine their efforts in the matter. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 38, Sep 81 p 14] 6521

CSO: 1841/25

BRIEFS

DIAMOND PRODUCTION UP--The labor watch of the collective of the Yerevan Synthetic Diamonds and Diamond Tool Plant is maintaining its high pitch. Having finished their 10-month production program ahead of schedule, the enterprise's laborers were able to surpass the production plan by 10,000 rubles worth of product since the beginning of the year. In comparison with the same period of last year, diamond and diamond tool production increased by more than 20 percent. Labor productivity increased significantly. The collectives of four brigades and dozens of workers completed their annual plans ahead of schedule. The Komsomol youth brigade of Shop No 5, headed by G. Muradyan, is in the lead. This collective pledges to complete one more quarterly plan by the end of the year. [By N. Ordinyan] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 1 Dec 81 p 1] 11004

WASTE RECYCLING--Several years ago the "Khimvolokno" Association sent more than 8,500 tons of waste to the dumps annually. But now this figure has been decreased by several orders of magnitude. Some forms of waste are recycled completely. This was possible owing to the opening of caprolactam and staple shops (in the "Kapron" production operation) and a consumer goods shop. Wasteless production processes are now making it possible to create additional products worth a million rubles. The attack against wastes will continue in the present 5-year plan. [By Yu. Antropov] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 1 Dec 81 p 2] 11004

NEW POLYSTYRENE SHOP--A new shop of the Omsk Plastics Plant has produced its first 10 tons of a valuable chemical product--polystyrene. It was sent to the Omsk "Elektrotochpribor" Plant. Initial adjusting operations are now continuing at the complex, which is outfitted with modern and automatic equipment. When it reaches its planned output capacity the complex will produce 100,000 tons of polystyrene per year. This material will be used to trim television sets, radios and other instruments, and household appliances. [By E. Chernyshev] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 26 Nov 81 p 2] 11004

CHEMICAL CONSTRUCTION BEHIND--The Novgorod "Azot" Production Association is supposed to get another large nitro-ammophos production operation this year. But whether it will or not, that is the question. This is hardly an idle question, not only to agricultural laborers who will begin receiving effective fertilizer from Novgorod chemists following a rather sizeable delay. It also troubles the chemists themselves and specialists of the "Glavkhimmontazh" administration of the USSR Ministry of Installation and Special Construction Work, who, owing to the general contractor, "Novgorodkhimstroy" Trust (director, G. Golubev) have found themselves in a difficult situation. The chemists have already included the potentials of the new complex in their production plans, and failure to meet the start-up deadline will impose a rather heavy burden upon their shoulders. The builders "robbed" the installers of time they needed to assemble the equipment: Seven out of the complex's 18 facilities are still not structurally ready. But even the others were turned over to the installers a minimum of 3 months late, and some up to half a year late. It is no surprise that within 10 months, barely half of the 37 million rubles planned for this construction site have been assimilated. This is not the first time the installers have had to make up the time lost by their partners. But with the time loss as it is, even their rich experience would barely help them put the construction project back on schedule, all the more so because as before, the builders do not seem to be in any hurry. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Nov 81 p 3] 11004

SUMGAIT CHEMICAL PRODUCTION BEHIND--Since the beginning of the year the collective of the Sumgait "Khimprom" Production Association (director, F. Sadykhov) fell short by a million and a half rubles worth of various products in its deliveries to Azerbaijani nonferrous metallurgical plants, synthetic and artificial fiber enterprises and other industrial sectors. The chemists miscalculated their demand for raw material--chloride salt. They did not order it in time, which led to lengthy shut-downs of large amine salt, sulfanol, and aluminum chloride production operations. Chlorine and caustic soda production indicators declined. New production capacities are being started up at "Khimprom" with considerable delays. This was the case, for example, with the aluminum chloride production operation, which was started up 10 months behind. Labor and production discipline is low and personnel turnover is high at the enterprise. Equipment is breaking down prematurely due to frequent violations of production processes. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Nov 81 p 3] 11004

GAS COMPLEX CONSTRUCTION FINISHED--Construction of the third generation of the Mubarekskiy Gas Complex was completed ahead of schedule. Now that this next generation of the complex has been placed into operation, Uzbekistan's sulfur processing capacity has reached 15 billion cubic meters, which means it will be possible to produce about 450,000 tons of high quality sulfur each year. Comrade L. I. Brezhnev warmly congratulated all participants of the construction project for their great labor victory. The builders and operators of the complex held a meeting. Leonid Il'ich's words of greeting were met with tumultuous applause. The text of the greeting was read by I. I. Golovachev, secretary of the Kashkadar'inskaya Oblast Committee of the Uzbek SSR Communist Party. The meeting's participants vowed to complete the assignments of the 11th Five-Year Plan ahead of schedule and to apply all effort to successfully implement the decisions of the 26th CPSU Congress. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 28 Nov 81 p 1] 11004

AMMONIUM PIPELINE FINISHED--Builders of the Tol'yatti-Odessa ammonia pipeline achieved a great labor victory. Erection of this pipeline, more than 2,400 kilometers long and capable of transporting 2.5 million tons of liquid ammonia each year, now makes it possible to provide highly valuable chemical fertilizer to many agricultural rayons of the Russian Federation and the Ukraine, and it is an important contribution to implementation of the food program of the 26th CPSU Congress. Comrade L. I. Brezhnev warmly congratulated all builders of the route on their labor victory. A meeting was devoted to this event, held 4 December in Moscow at the "Glavtruboprovodstroy" Trust. Speakers at the meeting vowed that they will apply all effort, knowledge and experience to successfully complete the plans. Meetings were convened on 4 December on the occasion of Comrade L. I. Brezhnev's letter of greeting by associated organizations participating in the construction of the ammonia pipeline, and at many points along the Tol'yatti-Odessa route. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 5 Dec 81 p 1] 11004

CSO: 1841/58

UDC 678.046.004

EFFECTIVE UTILIZATION OF MINERAL-ORGANIC FILLERS MADE OF PLASTIC FILM WASTE

Moscow PLASTICHESKIYE MASSY in Russian No 10, Oct 81 pp 47-49

KALINOVSKAYA, G. D., KOCHEROV, N. P. and SHALUN, G. B.

[Abstract] New or modified polymer materials can be produced using highly dispersed organic-mineral fillers obtained by grinding the wastes of multilayered plastics by various methods. Organic-mineral powders produced by grinding the wastes of multilayered plastics must be considered new types of fillers, since they consist of two firmly bonded parts: the cured thermosetting resin and the mineral or organic filler. Studies have shown that fractions with particle diameters of 70 to 100 μm of glass-reinforced plastics, fractions measuring 100 to 1500 μm of paper or fabric-based products are most suitable for industrial reuse. The presence of free functional groups on the surface of the organic-mineral fillers helps to increase the adhesion and strength characteristics of paint and varnish coatings based on the powdered composites. A significant improvement in adhesion properties is observed by introduction of up to 20% organic-mineral filler based on the wastes of glass-reinforced plastics with epoxy compound binder. Organic-mineral powders may also be widely used as fillers for cold-curing compounds based on polyester and other resins. References 4 (Russian).
[34-6508]

UDC 678.632'65:658.567.1

UTILIZATION OF PENTAERYTHRITE PRODUCTION WASTES

Moscow PLASTICHESKIYE MASSY in Russian No 10, Oct 81 pp 50-51

GULEVICH, P. Ye., PAKULIN, V. V., ROGACHEV, Yu. V. and KRUGLIKOVA, A. A.

[Abstract] A study was made of the possibility of using the mother liquor from the production of pentaerythrite from acetaldehyde and formaldehyde in the presence of calcium hydroxide as a surfactant. It was found that the surface-active properties are improved by condensation of products contained in the mother liquor at 65-70 C in the presence of such alkaline catalysts as NaOH or $Ca(OH)_2$. The surfactants synthesized were tested in belite slimes used in the manufacture of cement. The influence of the surfactant on the intensity of grinding of the raw mixture was tested in a two-chamber laboratory ball mill. It was found that introduction of 0.3% surfactant based on the mother liquor resulted in an increase in intensity of the process by 20%, and retarded thickening and seizing of the raw material. The economic effect of the use of the product was 200,000 rubles per year, due to a reduction in the consumption of water and of fuel. References 5: 4 Russian, 1 Western.
[34-6508]

REUSE RUBBER WASTES

Minsk PROMYSHLENNOST' BELORUSSII in Russian No 8, Aug 81 pp 22-23

LYAKHEVICH, G. and KUZNETSOVA, G.

[Abstract] The authors suggest that the wastes from the production of rubber be subjected to a process of thermal destruction in a solvent. This would allow complete utilization of the rubber production wastes without environmental pollution. A two-unit continuous-flow system is suggested for the purpose, with one unit processing materials containing metal and cord fiber, the other processing materials not containing these impurities. Suspensions of dissolved rubber are sent from unit 1 to unit 2, where rubber materials containing no metal are added. The suspension can then be used for manufacture of various products. The economic effectiveness of the system suggested is over 30 rubles per 1,000 m^3 of end product, or 515,000 rubles annually. The effect is still higher when formed rubber products are used as the output, up to 16 million rubles or 20% of the cost of the products produced.
[32-6508]

FACILITIES AND THEIR UTILIZATION

Minsk PROMYSHLENNOST' BELORUSSII in Russian No 8, Aug 81 pp 24-26

SUKHININ, V. and ZHIVOTNYUK, A.

[Abstract] A description is presented of the construction of the dimethylterephthalate shop recently opened in Mogilev. The builders managed to construct this shop ahead of schedule and under budget, by the use of such techniques as a network graph for the construction process. This successful construction experience is contrasted with the first section of the 4th potash combine in Soligorsk, where shortcomings in planning and poor quality manufacture of equipment have caused the facility to be slow in utilizing its planned capacity and over budget in cost. Figure 1.
[32-6508]

UDC 628.741

ESTIMATE OF FIRE DANGER OF RAW RUBBERS, FINISHED RUBBERS AND PLASTICS

Moscow KAUCHUK I REZINA in Russian No 10, Oct 81 (manuscript received 11 May 81) pp 53-56

BOGMAN, L. P., PUTIMTSEV, I. I. and FILIN, L. G., All-Union Scientific Research Institute of Fire Safety

[Abstract] This article reports specifics of evaluating the fire danger of raw and treated rubbers and plastics, as well as conditions of fire and explosion safety during their operation, transportation and storage. The fire danger of rubbers is determined in accordance with the system of evaluation accepted for plastics. Instructions have been developed on the basis of a systems approach, presenting a list of fire and explosion danger factors, methods of their determination and areas of application in accordance with the state standards. References 21 (Russian).
[46-6508]

UDC 66.092.147.3

THERMODYNAMIC ANALYSIS OF STAGE OF HOMOGENEOUS NUCLEATION IN PYROLYSIS OF HYDROCARBONS

Moscow NEFTEKHIMIYA in Russian Vol 21, No 5, Sep-Oct 81 (manuscript received 4 Aug 80) pp 698-704

FEDOROV, V. B., SHORSHOROV, M. Kh., POPOV, V. T., ROZHDESTVENSKIY, I. B., ZHIGUL'SKAYA, N. A., KALASHNIKOV, Ye. G., KHAKIMOVA, D. K. and VYGODSKAYA, Ye. M., Institute of Petrochemical Synthesis imeni A. V. Topchiyev, USSR Academy of Sciences; Institute of Metallurgy imeni A. A. Baykov, USSR Academy of Sciences; Power Engineering Institute imeni G. M. Krzhizhanovskiy, USSR Academy of Sciences

[Abstract] Thermodynamic analysis is presented of the initial stage of homogeneous nucleation upon pyrolysis of hydrocarbons, plus thermodynamic computation of the composition of the reaction products. A mechanism of carbon formation is suggested. When carbon does not condense in the 1700-2300 K temperature range,

the primary product of decomposition of benzene is acetylene. The process of elementary carbon formation may then occur through the excited state of this molecule. Figure 1; references 21: 13 Russian, 9 Western.
[44-6508]

FIRE DANGER AND TOXIC PROPERTIES OF INGREDIENTS

Moscow KAUCHUK I REZINA in Russian No 10, Oct 81 pp 56-57

[Abstract] This article consists of a table listing the chemical nomenclature, formula, purpose, external appearance, density, crystallization, boiling, flash and autoignition points, maximum permissible concentrations, safety measures to be followed in use, methods of extinguishing fires, and storage conditions for two substances, viz., m-xylene and colophony.
[46-6508]

FERTILIZERS

UKRAINIAN 9-MONTH FERTILIZER PRODUCTION STATUS

Kiev PRAVDA UKRAINY in Russian 23 Oct 81 p 1

[Article by Ye. Guzhva: "The Year's Finish Line is Near"]

[Text] The first month of autumn was not very good for a number of the republic's enterprises producing mineral fertilizers. Suffice it to say that seven major production operations failed to complete their September program. They even included the flagship of chemical industry--the "Azot" Production Association in Severodonetsk. The collective fell short of the plan by more than 10,000 tons of fertilizer. Of course, the chemists were let down by railroaders of the Donetsk trunkline, who were unable to get the rail cars to them on time to carry carbamide away. Things are now being straightened out for the workers of Severodonetsk.

As before, laborers of the Cherkassy "Azot" Production Association are leading the socialist competition among Ukrainian chemists: In 9 months they produced more than 85,000 tons of agricultural vitamins in excess of the plan. But even this enterprise has its problems. The nitrogen fertilizer shops are still having trouble organizing their work. Once again there was a noticeable production failure in September: Production of nitrogenous fertilizers fell short by 8,500 tons. The debt has now risen to 13,400 tons. At the same time the collectives producing phosphorus fertilizers are clearly on the plus side of the ledger in their work--98,500 tons. The association's party organization and administration have pledged to carefully study the causes behind the unsatisfactory work of the nitrogenous fertilizer producers and to take steps to clear up the problems in the production process.

Laborers of the Sumy "Khimprom" Association are confidently increasing their pace. Workers of both the nitrogenous and phosphorus fertilizer shops are successfully satisfying their socialist pledges adopted in honor of the 64th anniversary of Great October. Since the beginning of the year the collective has produced more than 25,000 tons of nitrogenous and almost 40,000 tons of phosphorus fertilizers in excess of its target.

The collectives of the Krymsk Titanium Dioxide Plant, the Vinnitsa and Konstantinov chemical plants, the Odessa Superphosphate Plant and the Priportovyy plant are working at a constant pace, without interruptions. As an example the laborers of Krymsk have now exceeded the plan by 8,100 tons of nitrogenous fertilizer and 9,600 tons of phosphorus fertilizer, and Vinnitsa chemists have exceeded the plan for production of granulated fertilizer by almost 17,000 tons.

The ammonia and carbamide shops of the Gorlovka "Stirol" Production Association are continuing to work at a feverish pace. This association suffered the largest deficit at the beginning of the year--187,400 tons. Just in September alone the workers of Gorlovka fell short of the production plan by 45,400 tons. Equipment has still not been readied for production in the new shop, as a consequence of which the production quotas are constantly not being met. The shortfall in 9 months totaled 120,000 tons of ammonium. One can imagine how much fertilizer could have been produced from such an enormous quantity!

Chemists of the Dneprodzerzhinsk "Azot " Association have fallen almost 75,000 tons behind the program this year. Half of this shortfall occurred last month.

The Rovno "Azot " Production Association was surprised to find itself in a serious situation. In September the production shortfall was almost 53,000 tons of nitrogenous and more than 17,000 tons of phosphorus fertilizers. And while satisfaction of socialist pledges was a certainty in as recently as August, now the annual program is threatened by failure, considering the sizeable deficit--67,500 tons.

Chemists of Stebnik are lagging behind as well: In September they built up a debt of 12,600 tons of potassium fertilizers. The main reason for the failure was a shortage of rail cars. But their colleagues from Kalush are making an effort to hold their own, even though the L'vov Railway is unable to keep the rolling stock coming regularly.

A little more than 2 months are left before the end of the first year of the 11th Five-Year Plan. And the republic's chemists must do everything they can to successfully complete their tasks and reach the finish line successfully.

11004
CSO: 1841/51

SUPPLY PROBLEMS SLOW DOWN FERTILIZER PRODUCTION

Kiev PRAVDA UKRAINY in Russian 8 Dec 81 p 1

[Article by A. Maslov: "Do Not Forget the Reserves"]

[Text] Mineral fertilizer production will be increased in the 11th Five-Year Plan by almost 1.5 times. This increment must be achieved not only by introducing new output capacities but also by raising labor productivity, revealing and utilizing reserves and maintaining an economical attitude toward energy, fuel and other material resources.

With what sort of results did the fertilizer enterprises of the republic's chemical industry finish the second-to-last month of the year?

November was a substantially successful month to the Severodonetsk Order of Lenin "Azot" Production Association imeni Leninskiy Komsomol. Socialist pledges adopted in honor of the 64th anniversary of October were satisfied ahead of time. The mineral fertilizer production plan was exceeded by 12,000 tons, compared with a pledge of 8,000 tons, and methanol production exceeded the plan by 3,280 tons, as compared to a pledge of 3,000 tons. Consumer goods production was almost double the planned amount. Products worth a total of 4.7 million rubles were sold in excess of the plan.

At the same time more than 100 million kilowatt-hours of electric power and 192,000 gigacalories of thermal power were saved, due in many ways to broad support to the initiative "Work 1 day out of every month on saved energy resources." Incidentally, there have now been 15 such days since the beginning of the year.

The collective of the Sumy "Khimprom" Production Association also believes thrift to be one of the main reserves. The following figures attest to this: Since the beginning of the year just Sulfuric Acid Shop No 6 saved raw materials and materials worth 57,200 rubles, the savings achieved by Sulfuric Acid Shop No 1 was 45,800 rubles, that in the defluorinated phosphate shop was 41,800 rubles, and the savings in the ammophos production operation was 104,600 rubles.

This year the enterprise produced an additional 20,000 tons of fertilizers. In November the collective reached its target for the production of acid, ammophos and granulated superphosphate. More than 1,500 tons of liquid complex fertilizers were produced in excess of the plan. Almost half of the products of the Sumy "Khimprom" association bear the honorary pentangle [State Seal of Quality].

The "Khimprom" Association is managing just as successfully with pledges adopted in honor of the 64th anniversary of Great October. By this date, two shifts of the fluoride salt shop, five teams and 129 individuals completed their annual plan. The cream of the crop included foreman B. N. Novobranets, team leaders S. P. Nechayev, V. M. Likholet, Yu. N. Kalinichenko and I. N. Lash, defluorinated phosphate shop instrument controller V. A. Tret'yak and Sulfuric Acid Shop No 2 instrument controller M. S. Belogur.

The "Khimprom" Association is a leader not only in the oblast. For its successes in the socialist competition it was awarded the sector ministry's perpetual Red Banner for the third quarter.

Odessa's superphosphate and port plants reached their target successfully. The Konstantinovka Chemical Plant produced more than 2,000 tons of fertilizer in excess of the plan for the national economy since the beginning of the year. It also completed the plan of the past month, despite interruptions in sulfur deliveries. Acid production equipment did not work at full capacity. The reason remains as before--not enough tank cars to move it out. We were told that the enterprise now needs 100-150 additional containers specifically for sulfuric acid. But the tank cars they are receiving--late at that, and many requiring repairs--are intended for petroleum.

The Krymsk Titanium Dioxide Plant fell short of the plan by 900 tons. But the situation is sure to be rectified in December. The Cherkassy "Azot" Association found itself in a more difficult situation. While it managed to satisfy the plan for phosphate fertilizer production, its production of nitrogenous fertilizers is already behind by about 13,000 tons, to include a November deficit of 8,500. In sum total the association plant surpassed the 11-month plan, but the impression is that it is living on old reserves. These reserves may be exhausted in December.

The Gorlovka "Stirol" Association fell short by 11,500 tons of fertilizer in November (this is in addition to a previously accrued 60,000 ton deficit). The Dneprodzerzhinsk "Azot" Association continues to work feverishly. Its indebtedness now totals 26,000 tons, to include 5,500 tons added in November.

Nor is the situation any better with the Rovno "Azot" Association. A lack of raw materials continues to have an effect on plan fulfillment, as do restrictions on natural gas deliveries and absence of box cars. As of today, the railroad owes the enterprise 300 rail cars. As a consequence about 22,000 tons of ammonium nitrate have had to be left on the ground. This forced shutdown of the nitro-ammophos shop, since there is no place to store the fertilizer.

"We are hauling it away ourselves," said the association's party committee secretary L. P. Stepanyuk, "though this means high losses. The resulting price of the fertilizer is staggering."

Warehouses are also completely full at the Stebnik Potassium Plant. That means 32,000 tons of potassium-magnesium concentrate and wet-ground kainite. And the debt to the state now stands at 40,000 tons. Once again the principal cause of failure is the shortage of rail cars. Here are the figures cited by the enterprise's director, I. I. Kovalishen: "For 7 months things went smoothly. Interruptions in rail car deliveries began in August: Deliveries were 340 cars short at first (with each able to carry 67 tons), they were 600 cars short in September, 1,408 cars short in October and 1,040 cars short in November. In sum total the L'vovskaya Railroad fell short by 3,300 cars. Needless to say, our equipment is not working at full capacity. In October and November equipment remained idle for more than 30 days. If we are to successfully complete the plan, the rolling stock must come in rhythmically."

As we can see, November was not an easy month for most enterprises. Difficulties in deliveries of raw materials, gas, electric power and rail cars had a major effect on fulfillment of the state plan. The conclusion is that all reserves must be placed into action. Otherwise many kolkhozes and sovkhozes that are now stockpiling fertilizers for spring planting will find themselves in difficult conditions.

11004
CSO: 1841/58

CONSTRUCTION PROBLEMS AT FERTILIZER PRODUCTION FACILITIES

Moscow IZVESTIYA in Russian 6 Dec 81 p 2

/Article by V. Romanyuk, economic correspondent for IZVESTIYA: "Construction Projects Which Work for the Harvest: Speed Up Construction of Fertilizer Production Enterprises"7

/Text7 Mineral fertilizers are called "granules of fertility" and "vitamins of the fields." It has been calculated that every ton of fertilizer provides an additional 1.1 tons of grain. The industry is constantly increasing its deliveries of the "vitamins of the fields" to kolkhoz's and sovkhoz's. The current five-year plan calls for a 1.5-fold increase in fertilizer output; in addition, the chemical workers have been assigned the task of producing more of the concentrated and complex fertilizers.

Plans call for the introduction of 140 industrial complexes to produce the granules of fertility and their raw materials within the five-year plan period. This will make it possible to increase the output of ammonia by 6.1 million tons, the output of sulfuric acid by 1.2 million tons, the output of sulfur by 2 million tons and the output of yellow phosphorus by 174,000 tons. In total, the implementation of the construction program of the five-year plan will ensure the production of an additional 8 million tons of fertilizers (converted to 100-percent nutrients).

At present, building and installation employees are working intensively on the priority projects of the first year of the 11th Five-Year Plan. The Voronezh builders marked the 64th anniversary of the Great October Revolution with a remarkable victory. On the eve of the famous date they opened up facilities with a production capacity of 450,000 tons of ammonia per year at the Pridonskoy Chemical Plant.

Similar work is also being done by the builders at fertilizer facilities in Dneprodzerzhinsk. The collective of the Dneprokhimstroy Trust has reported that facilities with a production capacity of 240,000 tons of weak nitric acid have been put into operation successfully at the Dneprodzerzinsk Azot Production Association.

Twenty construction sites related to fertilizer production have been designated as the priority projects for 1981. Many of these are in operation or close to completion. The workers who created the new ammonia production capacities at the Rustavi Chemical Plant have reached the very finish line. The builders were let down by the employees of the Velikanadol'sk Plant for Heat Resistant Materials of the USSR Ministry of Ferrous Metallurgy, who were late in sending materials. In order to make up for the loss of time the people here decided that they would--without waiting for the completion of all the work--supply converted gas from an operating line to the department for the synthesis of new power; their purpose was to begin development of a new industrial process now. The installation workers of the No 1 Zakavkazmetallurgstroy Trust have their work cut out for them: they must intensify as much as possible their work on the thermal insulation and installation of equipment for the reforming furnace.

The essential effort is being exerted for the construction of sulfuric acid production capacities at the Almalyk Chemical Plant and the sulfuric acid plant in Komsomol'sk-na-Amure, as well as for the production of phosphoric acid at the Meleuz Chemical Plant. Facilities with a production capacity of 990,000 tons of carbamide are being prepared for official turn over at the Berezniki Nitrogen Fertilizer plant by the collective of the building site, which comes under the Glavzapaduralstroy Trust No 1. The Apatitstroy collective has opened up facilities for the processing of 2.4 million tons of apatite-nepheline ore at the Apatite Production Association in Murmanskaya Oblast; next in line are facilities with production capacities of 1.4 million tons per year. The construction of a garage with repair facilities here must be speeded up as they are extremely important in polar areas.

At the November (1981) plenum of the CC CPSU, Comrade L.I. Brezhenv noted: "It is precisely at the priority construction sites that there must be the maximum concentration of labor, material and financial resources, and that everything necessary for the fastest possible start of operations must be provided. Toward this end it will be necessary to increase the mobility of construction organizations and to carry out the timely relocation of equipment and personnel."

The concentration of forces in this manner is a maneuver: the carefully considered organization of work is goal-directed and effective. And it has nothing in common with periods of "storm work," when many people and much equipment are gathered at one site but the work moves slowly due to confusion of various kinds. It seemed that the collective of Kemerovokhimstroy, which was building a unit for the production of carbamide at the Kemerovo Azot Production Association, had no problems. But at the very end, the pace fell noticeably although there were sufficient fronts, especially among the installation workers, for shock work.

Unfortunately, there is a whole series of construction sites at which large forces are concentrated and yet output amounts to only about 50 percent of the usual per employee. The reasons: poor preparation for production, violation of industrial procedures and the sequence of work and a mass of incomplete matters which must be returned to again and again. As a result, many thousands of tons of metal parts, and equipment, a significant portion of which has been imported, lie undisturbed for years or are simply pilfered to "finish off" other facilities.

We talk with Yu. Mavlyaviyev, head of the production and operations division of the USSR Ministry of Fertilizers, about the fertilizer industry's construction projects. Again and again he says in anger: "An unrealistic facility." But why are these construction projects, for which resources are allotted and equipment purchased, completely "realistic" at the beginning of the year suddenly called "unrealistic?"

Let us take, for example, the Karatau Production Association in Dzhambulskaya Oblast. The collective of the Karataufosforstroy Organization was supposed to open up here facilities for the production of phosphorus meal. They are considered a priority project and what comes of it? With a limit for this year of 23.2 million rubles for construction and installation work in the first ten months, only 14.1 million rubles worth of work has been completed. Nor did the rate of work increase in November, with the result that in December there remained building and installation work worth more than 7 million rubles. And even now this facility has no heat supply; no pipelines to the boiler room have been laid There is a shortage of about 900 workers to carry out the work which has been started as well as the measures which have been planned.

As a result of this situation, it is fair to ask the Kazkh SSR minister for the construction of heavy industry enterprises, A.V. Lomov, the following question: "When will this game of leap frog with start-up dates end? The start up dates are established in order to concentrate forces and resources in the most important areas."

The fate of the priority facilities of the Tol'yattiazot Production Association turned out to be different, but also unhappy. Two units for the production of ammonia were scheduled to open here. Unit No 5 was put into operation after a significant delay. As for No 6, the directors of the Main Administration for Special Plant Construction of the USSR Ministry of Power and Electrification have been trying to prove that it is an "unrealistic facility."

We listen to L. Bakshtanskiy, deputy head of the Main Administration for Special Plant Construction:

"The opening of the sixth unit was planned for the fourth quarter of the year. But by the end of the year the builders of Kuybyshevgidrostroy were 4 million rubles worth of construction and installation work behind their schedule. At the Novgorod Azot Production Association there is a four-five month delay in building a unit to produce a very valuable fertilizer--nitroammophoska. And this despite the fact that Trust No 43 of the USSR Ministry of Construction had every opportunity and resource here."

The construction projects, as we see, are different, but the situations are similar in many respects. Let us note: many of the priority projects began operations in winter, when the buildings did not even have a heat supply; without the latter, it is impossible to carry out much of the finishing work, not to mention the installation and adjustment of the industrial equipment. In some places the priority facilities are left a quarter incomplete by the work force, and in some places even more. The technical documentation continues to be "finished off" up to the very end, thus giving the contracts a chance to contribute their bit to the chain of squabbles.

In a situation like this what value is there to the assurances by the directors of many high-level agencies, who express in words their concern for the development of the fertilizer industry, which increases and protects the harvest of the fields and the orchards, but who in fact prefer to remain aloof?

There is another circumstance which should be noted. Many construction projects, including even some which are "successful" from the viewpoint of deadlines are put into operation despite deficiencies: they lack housing, cultural and welfare services. For example, new facilities have been put into operation at the Yavorov Sera Production Association (L'vovskaya Oblast') this year. It is essential to take on 1,400 chemical workers to service the complex. But people do not come here willingly: there is no housing. This year the builders of the Yavorovkhimstroy Trust were supposed to produce 50,000 square meters of housing for the chemical workers and 10,000 for their own collectives. They limited themselves to the construction of their own housing, while the chemical workers did not receive a single meter.

Here is what M. Yatsunenko, deputy head of the All-Union Soyuzsera Association says on this subject:

"Without the housing, the new production of sulfur will be slow to reach the planned figures. There is a special decision which applies to this case. The Ukrainian SSR Ministry of Industrial Construction and the minister himself, A. Shchepetil'nikov, are obligated to carry it out."

It cannot be said that the issues of construction and start up of facilities for the production of fertilizers and the raw materials for them have escaped the attention of the central agencies. They have been considered repeatedly at joint collegia of the Ministry of Mineral Fertilizer Production, the Ministry of Industrial Construction and the Ministry of Installation and Special Construction Work. However, endless statements about disruptions, instructions and things "brought to one's attention" have so far not yielded results.

Here, for example, before us is a protocol from a 27 October 1981 meeting with the minister for the production of mineral fertilizers, A. Petrishev, held to consider the status of the construction of the Yefremov Chemical Plant in Tul'skaya Oblast'.

"Note that construction work on the sulfuric acid production complex is being carried out at an unsatisfactory rate, which will not ensure completion of all work in the current year. The residual volume of construction and installation work based on the status as of 1 October 1981 is 5.4 million rubles, while the fulfillment of the plan in September amounted to 1.1 million rubles. The expected fulfillment of the plan of construction and installation work in October is 1.2 million rubles. The project has not been provided with the necessary number of workers."

A month has passed since the meeting, but the situation at the construction site has not changed much for the better: many of the facilities noted in the protocol are delayed. Incidentally, the shortage of sulfuric acid, which the new units in Yefremov are supposed to produce, is holding up the development of phosphorus fertilizer production in the USSR; nor is this raw material being supplied to those facilities which have already been built and which could produce significantly more of the "granules of fertility."

Incidentally, according to available calculations, the present rates for the building of sulfuric acid and phosphoric raw material production units will mean that the use coefficient for the utilization of facilities which produce phosphorus fertilizers will not exceed 87-88 percent by the end of the five-year plan. And it is, after all, these very phosphorus fertilizers which, when applied to the soil, reduce ripening times for cereal crops by 10-12 days; this is extremely important for our Eastern regions.

We must also take note of the fact that in many construction ministries there has developed an attitude according to which fertilizer industry construction projects are considered of secondary importance. There is evidence of this in the table given below, which reflects the data for the fulfillment of the specified quotas for construction and installation work in the first 10 months of 1981 for the ministries as a whole (first column) and for mineral fertilizer construction sites (second column):

USSR MINISTRY OF CONSTRUCTION OF HEAVY INDUSTRY ENTERPRISES	102.7	95
USSR MINISTRY OF INDUSTRIAL CONSTRUCTION	91	77
USSR MINISTRY OF POWER AND ELECTRIFICATION	93	83
USSR MINISTRY OF CONSTRUCTION	93	93
USSR MINISTRY OF CONSTRUCTION IN THE FAR EAST AND TRANSBAYKAL REGIONS	90	87

We asked I. Barskiy, deputy head of the Chemical Department of USSR Gosplan, to comment on these figures.

"The attention given to fertilizer production has definitely weakened in recent years," he said. "In the Eighth and Ninth five-year plans the targets for these construction projects were successfully met and agriculture received sufficient amounts of fertilizers, but in the Tenth Five-Year Plan the situation changed for the worse. As a result, the target of 40 million tons of fertilizers was not met in 1980. And this inertia, unfortunately, is continuing in our country in the Eleventh Five-Year Plan. In the first ten months of 1981 about 80 million rubles worth of construction and installation work allotted for fertilizer-related construction projects was not put to use. And this was at a time when there had been a significant improvement in the supply of industrial equipment--both imported and domestic--to construction projects. In the current five-year plan more than half of the new fertilizer capacities--on the order of 5.2 million tons (converted to 100 percent nutrients) are scheduled for opening in 1983-1984, and in order to supply them it is essential to start up the priority projects on time. To postpone them means leading to a subsequent dispersion of forces and resources which cannot be permitted."

A few weeks remain before the end of the first, beginning, year of the five-year plan. Here is the program for fertilizer construction projects which must be completed in the current year: capacities for the production of 3,179,000 tons of standard units of mineral fertilizers, capacities for the production of 400,000 tons of sulfur per year, 1,050,000 tons of sulfuric acid in monohydrate and 4,000 tons of plant pesticides. The experience of the past five-year plans, the example of innovators and effective monitoring by the Councils of People's Deputies should contribute to the achievement of the above targets. Putting new facilities for the production of mineral fertilizers to work on time or ahead of schedule means providing a good foundation for future harvests.

There is a good reason why the flask and an ear [of grain] symbolize the union of the chemical workers and the grain growers. This union must grow stronger from year to year!

8543
CSO: 1841/60

UDC 631.81

INFLUENCE OF LONG TERM APPLICATION OF MINERAL FERTILIZERS ON PRODUCTIVITY OF CROP ROTATION SYSTEMS AND AGROCHEMICAL INDICES OF SOILS

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 10, Oct 81 pp 49-52

POSTNIKOV, A. V., SHAFRAN, S. A. and VINOGRADOVA, R. I., candidates of agricultural sciences, All-Union Scientific Research Planning and Technological Institute of the Chemical Industry

[Abstract] A previous report studied the influence of systematic application of fertilizers under production conditions on agrochemical indices of soils and harvests of agricultural crops in 19 crop rotation systems in various zones of the Russian Federation. This report summarizes the results of long term field experiments conducted in 1970-1980 by the RSFSR Agrochemical Service and attempts to determine regularities in the influence of fertilizers on the productivity of crop rotation systems and agrochemical indices of soils with various relationships of inflow and outflow of nutrient substances in the soil-plant system. The results of experiments indicate that in all of the soils studied the use of fertilizers significantly increases the productivity of the soil. The balance of nutrient substances varied from experiment to experiment. In all cases the influx of phosphorus with the fertilizers exceeded its loss with the harvest. There was a certain relationship between the balance of phosphorus and the change in the content of its mobile form. In soddi podzolic sandy loam soil with a low content of mobile phosphorus, an increase in the expenditure of phosphorus pentoxide in the fertilizer was required. Liming helps to decrease the expenditure of fertilizer required to accumulate phosphates in the soil. In chernozem, in two cases with a positive phosphorus balance, the content of mobile phosphates remained practically unchanged. The potassium balance in most cases was positive, facilitating an increase in its content in the active soil layer. In chernozem, in three cases the potassium balance was negative, decreasing the content of K_2O in the soil. Field experiments studying the balance of nutrient substances should be accompanied by laboratory and lysimetric studies. The combination of these methods allows a reliable scientific foundation to be worked out for development of systems of fertilizers intended to improve the fertility of soils and increase the harvest of agricultural crops.
[43-6508]

ORGANOMETALLIC COMPOUNDS

UDC 547.258.2'131.1'539.151

SYNTHESIS AND PROPERTIES OF TRIS (PENTAFLUOROPHENYL)TITANIUM

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 51, No 9, Sep 81
(manuscript received 9 Feb 81) pp 2004-2007

RAZUVAYEV, G. A., VYSHINSKAYA, L. I. and TIMOSHENKO, S. Ya., Scientific Research Institute of Chemistry of Gor'kiy State University imeni N. I. Lobachevskiy

[Abstract] Tris(pentafluorophenyl)titanium was synthesized using the exchange interaction of $TiCl_3 \cdot 3THF$ with C_6F_5MgCl in a solution of tetrahydrofuran(THF). It was found that successful separation of the compound depends heavily on the reaction conditions: the use of THF as the solvent, optimal temperature range of 0 to +5°C, order of addition of reagents (transition metal salt must be added to the Grignard reagent). The reaction mixture thus produced was used to produce dark-green tris(pentafluorophenyl)titanium tetrahydrofuranate crystals. The product is thermally stable. The quantity of $(C_6F_5)_3Ti \cdot 3THF$ in the solution can be determined by iodometric titration. The $Ti-C_6F_5$ bond in the compound produced is split by mercuric chloride, acids or acetylacetone.

[28-6508]

UDC 548.18.547

SYNTHESIS AND CATALYTIC PROPERTIES OF DIALKYPHOSPHITE COMPLEXES OF RHODIUM

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 51, No 9, Sep 81
(manuscript received 13 Apr 81) pp 2146-2147

NIFANT'YEV, E. Ye. and KUKHAREVA, T. S., Moscow State Pedagogic Institute imeni V. I. Lenin

[Abstract] A series of hydride-type complexes was synthesized and their catalytic properties studied. The initial compounds used were dimethylphosphite, diethylphosphite, $[RhCl(C_8H_{12})]_2$ (I) and $[RhCl(CO)_2]_2$ (II). During complex formation, carbon monoxide and cyclooctadiene were liberated. Complexes of various compositions were produced differing in melting point, chromatographic mobility and certain other properties, depending on the ratio of the reagents and the type of solvent used. A study was made of the interaction of salts (I) and (II) with 6-ethylphosphite of 1,2,3,4-diisopropylidine galactopyranose and 3,5-cyclophosphite of 6-deoxy-1,2-isopropylidine glucofuranose. Phosphite carbohydrate-containing complexes of Rh(I) were synthesized and were optically active substances. The hydrogenation catalysts are also optically active. References 2: 1 Russian, 1 Western.

[28-6508]

UDC 547.26'118+547.79+548.737

STRUCTURE OF ORGANOPHOSPHOROUS COMPOUNDS, PART 18: CRYSTALLINE AND MOLECULAR STRUCTURE OF 2-OXO-5-TERT-BUTYL-1,3,2-OXAZAPHOSPHOL TETRAMER CONTAINING 8-MEMBERED PHOSPHAZANE RING

Novosibirsk ZHURNAL STRUKTURNOY KHIMII in Russian Vol 22, No 4, Jul-Aug 81
(manuscript received 28 Feb 80) pp 98-102

ANTIPIN, M. Yu., STRUCHKOV, Yu. T., BALITSKIY, Yu. V. and GOLOLOBOV, Yu. G.,
Institute of Heteroorganic Compounds, USSR Academy of Sciences; Institute of Organic Chemistry, Ukrainian Academy of Sciences

[Abstract] The interaction of α-aminopinacoline bromohydrate (I) and PCl_3 in the presence of triethylamine yields a mixture of crystalline oligomers of 5-tert-butyl-1,3,2-oxazaphosphol [$(C_6H_{10}NOP)_m$, where m is 2, 3, 4 (II)], which were identified by IR, NMR and mass spectra. Extraction of mixture II with boiling toluene in air for 4 hours yields a mixture of crystalline substances (III) with m.p. over 300°C. Mixture III consists primarily of very small crystals with a small quantity of larger crystals 0.10 to 0.15 mm in diameter, octahedral in shape. These were selected for x-ray structural analysis which proved that these crystals are the tetramer $(C_6H_{10}NOP)_4O_4$ (IV), with an 8-member phosphazane ring structure. The crystalline structure of IV consists of discrete molecules located at the usual Van-Der-Waals distances from each other. Figure 1; references 20: 5 Russian, 15 Western.
[30-6508]

UDC 547.26'118+547.241+547.245

DIHALOGENTRIOXYPHOSPHORANES AND PENTAOXYPHOSPHORANES BASED ON 2,6,7-TRIS(TRICHOROMETHYL)-1,4-DIPHOSPHA-3,5,8-TRIOXABICYCLO[2,2,2]OCTANE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 51, No 9, Sep 81
(manuscript received 25 Nov 80) pp 1950-1956

MARKOVSKIY, L. N., SOLOV'YEV, A. V., PIROZHENKO, V. V. and SHERMOLOVICH, Yu. G., Institute of Organic Chemistry, Ukrainian Academy of Sciences

[Abstract] In order to determine the influence of cellular bicyclooctane structure on the stability and properties of compounds of pentacoordinated phosphorus, the authors attempted to synthesize certain phosphoranes. By analogy with the method of producing acyclic pentaalkoxyphosphoranes (Markovskiy et al, 1980), the pentaoxyphosphoranes can be synthesized using (Z=OR)-products of the initial attachment of halogens to phosphorites. The cellular structure of 2,6,7-tris (trichloromethyl)-1,4-diphospha-3,5,8-trioxabicyclo-[2,2,2]octane facilitates the formation of stable pentacovalent trioxydihalogenphosphoranes, which are convenient initial compounds for the synthesis of pentaoxyphosphoranes with bicyclooctane fragments. References 15: 3 Russian, 12 Western.
[28-6508]

UDC 547.26'118

INTERACTION OF PHOSPHORUS PENTAIODIDE WITH PHENOL

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 51, No 9, Sep 81
(manuscript received 25 Nov 80) pp 1962-1964

KOSTINA, V. G.

[Abstract] It is discovered that when PI_5 interacts with phenol in a ratio of 1:1, the reaction product is not phenoxytetraiodophosphorane as previously reported by the same author but rather a mixture of the polyiodide compound $(C_6H_5O)_3PI_9$ and PI_3. Apparently, the reaction of PI^5 with phenol occurs first by formation of phenoxytetraiodophosphorane, which is immediately disproportionated to triphenoxyiodophosphonium iodide and PI_5. The products of disproportionation then react to form first triphenoxyiodophosphonium triiodide, then the polyiodide compound. It is also possible that triphenoxyiodophosphonium iodide may be formed not as a result of disproportionation, but rather as a result of replacement of iodine atoms by phenoxy groups. References 7: 3 Russian, 4 Western.
[28-6508]

UDC 547.298.3

FLUOROPHOSPHAZOSILANES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 51, No 9, Sep 81 (manuscript received 9 Dec 80) pp 1971-1975

FILONENKO, L. P., KUDRYAVTSEV, A. A. and PINCHUK, A. M.

[Abstract] The authors have recently developed a method of synthesis of chlorophosphaosilanes from N-chlorodisilazanes and various types of chlorides of trivalent phosphorus and studied their properties. This method of synthesis of chlorophosphazosilanes has been found usable for the synthesis of fluorophosphazosilanes as well. N-chlorohexamethyldisilazane reacts easily with various trivalent phosphorous fluorides to form fluorophosphazosilanes. Diethylamidodifluorophosphasotrimethylsilane reacts with phosphorous trichloride, phosphorous oxychloride and silicon tetrachloride breaking the nitrogen-silicon bond and forming phosphazo compounds of new types. The reaction of diethylamidodifluorophosphazotrimethylsilane with hydrogen fluoride leads to the formation of an unstable diamidotrifluorophosphorane. References 8: 3 Russian, 5 Western.
[28-6508]

UDC 542.91+661.718.1

PRODUCTION OF DIETHYLAMIDOPHOSPHITES AND ALKOXYCARBONYLMETHYLAMIDOPHOSPHITES OF α,β-ISOPROPYLIDENEGLYCERINE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 51, No 9, Sep 81 (manuscript received 16 Dec 80) pp 1975-1978

NIKONOROVA, L. K., GRECHKIN, N. P. and ZHELONKINA, L. A., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Kazan' Affiliate, USSR Academy of Sciences

[Abstract] A description is presented of the reaction of alcoholysis of alkylphosphorous acid diamides for phosphorylation of α,β-isopropylideneglycerine. Phosphorylation was performed at up to 140°C by an equimolar mixture of reagents, liberating diethylamine 75-80%. Reamidization of the alkyl (3,3-dimethyl-2,4-dioxacyclopentylmethyl)diethylamidophosphites produced in the alcoholysis by alkylamidoacetates produced alkyl(3,3-dimethyl-2,4-dioxacyclopentylmethyl)alkoxycarbonylmethylamidophosphites. References 6: 4 Russian, 2 Western.
[28-6508]

UDC 547.26'118

INTERACTION OF INCOMPLETE FLUOROPHENYLPHOSPHONOUS ACID ESTERS WITH CARBONYL COMPOUNDS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 51, No 9, Sep 81
(manuscript received 26 Jan 81) pp 1979-1982

BAGROV, F. V., ABRAMOVA, M. V. and KISELEV, V. I., Chuvash State University imeni I. N. Ul'yanov

[Abstract] A study was made of the reaction of incomplete ethyl p-fluorophenylphosphonate with aldehydes and ketones in order to study the influence of electronegative substituents in the aromatic ring of phenylphosphonous acid esters on the reactivity of the compounds with carbonyl compounds and on the thermal stability of the reaction products. The carbonyl compounds used were ketones, aliphatic and aromatic aldehydes. The products of attachment were crystalline substances or viscous liquids which were purified by recrystallization or washing with a solution of sodium bisulfate. The structure of the compounds produced was confirmed by IR and PMR spectroscopy. Differential-thermal analysis was used to study the thermal behavior of ethyl α-hydroxyalkyl-p-fluorophenylphosphonates. Studies were performed at 18-400°C. Figures 2; references 8 (Russian).
[28-6508]

UDC 547.26'118

CERTAIN DERIVATIVES OF DIALKYLDITHIOPHOSPHORYLPROPIONIC ACIDS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 51, No 9, Sep 81
(manuscript received 30 Jan 81) pp 1982-1988

BELOVA, L. A., MANDEL'BAUM, Ya. A. and SOYFER, R. S., All-Union Scientific Research Institute of Chemical of Plant Protection Agents

[Abstract] In order to produce new biologically active substances and study the influence of structure on their activity, derivatives of 0,0-diakyl-S-[2-(substituted carbonylmethylthiocarbonyl)ethyl]dithiophosphates (I) were synthesized, distinguished from those described previously in the literature in that the thioglycolic acid radical is separated from the PS_2 fragment by a propionyl group. Two methods of production of the compounds were studied, beginning with salts of dialkydithiophosphoric acids and derivatives of S-(β-chloroproponyl)thiogylcolic acids (method A) and with 0,0-dialky-S[2-chlorocarbonyl)ethyl]dithiophosphates and derivatives of thioglycolic acid in the presence of bases (method B). It was shown that 0,0-dialky-S-2-(alkoxycarbonylmethylthiocarbonyl)ethyldithiophosphates can be produced by both methods, while 0,0-dialky-S-[2-(N-alkylcarbamylmethylthiocarbonyl)ethyl]dithiophosphates can be produced only by method B. The compounds were found to be fungicidal, but not as strongly so as tetramethylthiuramdisulfide. References 5: 3 Russian, 2 Western.
[28-6508]

UDC 547.241+547.33

NEW EXAMPLES OF REVERSIBILITY OF REACTIONS OF TRIVALENT PHOSPHORUS DERIVATIVES WITH UNSATURATED ELECTROPHYLIC REAGENTS

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 51, No 9, Sep 81
(manuscript received 9 Mar 81) pp 2135-2136

GAREYEV, R. D., SHERMERGORN, I. M. and PUDOVIK, A. N., Kazan' Veterinary Institute imeni N. E. Bauman

[Abstract] A study of the reactions of trivalent phosphorus derivatives with conjugated nitroalkenes has shown that the nature of the compounds formed depends essentially on the conditions of conducting the reactions. This indicates reversibility of the process of formation of the phosphorane adducts, i.e., the presence of equilibrium between the initial reagents corresponding to the bipolar ion and phosphoranes. To prove reversibility, phosphorane was decomposed in the presence of methyliodide, producing a mixture which was studied by TLC and NMR spectroscopy. The reversibility of the reaction of 0, 0-dimethylphenylphosphonite with 1-nitro-3-methyl-1-butene was similarly proven.
[28-6508]

UDC 547.241+547.31

HOMOLYTIC STAGES IN REACTIONS OF O-METHYLDIPHENYLPHOSPHONITE WITH 1-NITRO-1-PROPENE AND PHOSPHORANES FORMED FROM THEM

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 51, No 9, Sep 81
(manuscript received 9 Mar 81) pp 2137-2138

GAREYEV, R. D., SAVIN, V. I., IL'YASOV, A. V., LEVIN, Ya. A., GOLDFARB, E. I., SHERMERGORN, I. M. and PUDOVIK, A. N., Kazan' Veterinary Institute imeni N. E. Bauman; Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, USSR Academy of Sciences

[Abstract] A study of the reaction of O-methyldiphenylphosphonite Ph_2POMe(I) at 20-30°C, attaching $MeCH=CHNO_2$(II) to form phosphorane (IIIa), yielding at higher temperatures $Ph_2(O)OMe$(IV) and $Ph_2P(O)CMe=CH_2$(V), established that this reaction includes homolytic stages, as well as isomerization of phosphorane. The facts observed agree with a system, a key stage in which is its single-electron transfer from phosphinite to 1-nitro-1-propene forming an ion-radical pair. The absence of observed polarization of the initial phosphinite indicates that this transfer is virtually irreversible and that the main path of conversion is recombination to a bipolar ion or other processes leading to products (IV) and (V).
References 2 (Russian).
[28-6508]

UDC 547.26'118

REACTIONS OF N-THIOPHOSPHORYLTHIOBENZAMIDES WITH CYCLOHEXYLISONITRILE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 51, No 9, Sep 81
(manuscript received 12 Mar 81) pp 2138-2139

ZABIROV, N. G., ZIMIN, M. G., CHERNOV, P. P. and PUDOVIK, A. N.,
Kazan' State University imeni V. I. Ul'yanov-Lenin

[Abstract] Results are reported of an investigation of the interaction between cyclohexylisonitrile and N-(O,O-dialkylthiophosphoryl)thiobenzamides, synthesis of which was described earlier (Pudovik, et al, 1975-1979). The reactions of cyclohexylisonitrile with the compounds in question (Ia-c) occurred in ether or benzene at 15-20°C over 5 days with a ratio of the initial reagents of 1:1. After removal of solvent under a vacuum, light yellow crystalline products were obtained (yield 61-88%), which had the structure S-(N-cyclohexylformimidoyl)-N'-(O,O-dialkythiophosphoryl)isothiobenzamides. References 6: 4 Russian, 2 Western.
[28-6508]

UDC 547.26'118

REACTION OF SILYLPHOSPHITES WITH THIOKETONES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 51, No 9, Sep 81
(manuscript received 12 Mar 81) pp 2140-2141

ZIMIN, M. G., BURILOV, A. R. and PUDOVIK, A. N., Kazan' State University imeni
V. I. Ul'yanov-Lenin

[Abstract] A study is made of the reaction of dimethyl- and diethyl (trimethylsilyl)phosphites with thiocyclohexanone and methylethylthioketone at 5-20°C in dry argon with a ratio of the initial reagents of 1:1. The products of the interaction are dialkyl α-(trimethylsilylthio)alkylphosphonates (Ia-c). The IR spectra of the compounds (Ia-c) include absorption bands at 975-990, 1030-1050, 1170-1180 and 1250-1260 cm^{-1}. References 6: 2 Russian, 4 Western.
[28-6508]

UDC 542.91:547.1'116

ACID ISOMERIZATION OF 5,10-DIHYDRO-5-PHENYL-10-R-10-HYDROXYDIBENZO[b,e]-PHOSPHORINES

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 51, No 9, Sep 81
(manuscript received 23 Mar 81) p 2142

PETROV, K. A., CHAUZOV, V. A. and LEBEDEVA, N. Yu.

[Abstract] It was found that 5,10-dihydro-5-phenyl-10-R-10-hydroxydibenzo[b,e]-phosphorines (I), when heated in hydrochloric acid, are converted to 5,10-dihydro-5-phenyl-10-R-5-oxodibenzo[b,e]phosphorines (II). This is an oxidation-reduction reaction, similar to pseudoalkyl regrouping and isomerization of p-diphenylphosphinobenzhydrol, in this case possibly passing a stage of formation of an unstable P-π heterocycle (III). To confirm that dibenzophosphorines (II) are not products of the oxidation of (I), dibenzophosphorine (Ia) was interacted with hydrogen peroxide to synthesize the product of possible oxidation, 5,10-dihydro-5,10-diphenyl-10-hydroxydibenzo[b,e]phosphorine-5-oxide (IV), which was found to differ significantly in melting point and elementary analysis from the product of regrouping (IIa).
[28-6508]

UDC 547.241+546.172

NITROSATION OF TRIETHYLPHOSPHONOACETATE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 51, No 9, Sep 81
(manuscript received 5 May 81) pp 2145-2146

KHOKHLOV, P. S., KASHEMIROV, B. A. and STREPIKHEYEV, Yu. A., Moscow Institute of Chemical Technology imeni D. I. Mendeleyev

[Abstract] A study was made of nitrosation of the triethyl ester of phosphonoacetic acid with nitrosylchloride. It was found that the sodium and potassium derivatives of the diethoxyphosphonoacetate do not nitrosate with the formation of a C-nitrosated product, whereas when the ethoxymagnesium salt is used, triethyl α-oxyminophosphonate was produced. The structure was confirmed by elementary analysis, IR, NMR and mass spectra. References 2 (Russian).
[28-6508]

UDC 541.341

PHOSPHORYLATION OF SYMMETRICAL ACETYLENES WITH PHOSPHORUS PENTACHLORIDE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 51, No 9, Sep 81
(manuscript received 6 Apr 81) pp 2147-2148

KOLBINA, V. Ye., ROZINOV, V. G., MIRSKOVA, A. N., LUTSKAYA, N. V., DONSKIKH, V. I. and VORONKOV, M. G., Irkutsk State University imeni A. A. Zhdanov; Institute of Petrochemistry and Coal-Chemical Synthesis of Irkutsk State University; Irkutsk Institute of Organic Chemistry, Siberian Division, USSR Academy of Sciences

[Abstract] It was found that 1,2-di(butylthio)acetylene is quantitatively phosphorylated by phosphorus pentachloride. The reaction plan is presented. The first product obtained is liquid a state unusual for this salt compound type. 1-Butylthio-2-isobutylthioacetylene reacts similarly with phosphorus pentachloride. Reference 1 Russian.
[28-6508]

UDC 547.341

OXIDATIVE AND PHOTOINITIATED INTERACTION OF PHOSPHORUS TRIHALIDES WITH ALLENE

Leningrad ZHURNAL OBSHCHEY KHIMII in Russian Vol 51, No 9, Sep 81
(manuscript received 28 May 81) pp 2154-2155

SENDYUREV, M. V., DOGADINA, A. V., KALECHITS, I. V., TABER, A. I., IONIN, B. I. and PETROV, A. A., Leningrad Institute of Technology imeni Lensovet

[Abstract] It was found that oxidative chlorophosphorylation of allene and photoinitiated attachment of phosphorus tribromide to allene lead to products with the phosphorus-carbon bond but with different regiostructures. Oxidative chlorophosphorylation of allene occurs unselectively. The main product of the reaction is dichloroacetone. Of the phosphorus-containing products, 1-chloro-2-propene-2-phosphonic acid chloride is formed together with a small quantity of isomer 2-chloro-2-propene-1-phosphonic acid dichloride. The results produced indicate that there are significant differences in the mechanism of oxidative chlorophosphorylation of allene and photoinitiated attachment of phosphorus tribromie to allene.
[28-6508]

PESTICIDES

UDC 628.3:66.093.8

USING ORGANOPHOSPHORUS PESTICIDE HYDROLYSIS IN WASTE WATER PURIFICATION

Kiev KHIMIYA I TEKHNOLOGIYA VODY in Russian Vol 3, No 5, Sep-Oct 81
(manuscript received 15 Jan 81) pp 433-435

MARCHENKO, P. V., GRECHKO, A. V. and KRAVETS, Ye. V., Institute of Colloid Chemistry and Water Chemistry imeni A. V. Dumanskiy, UkSSR Academy of Sciences, Kiev

[Abstract] Kinetic parameters of the alkaline hydrolysis of the pesticides malathion, dimethoate, actellic, fenchlorophos and trichlorphon were studied at pH 8-11.5 and 20° by thin layer and gas chromatography. The reaction was found to be described by a first order equation. At pH 8, pesticide half lives ranged from three to 46 days, while, at pH 11, all half lives were less 1.5 days. The data indicate that alkaline hydrolysis is a promising and economical method of water purification. On maintaining waste water from a pesticide warehouse for two days at pH 11.3, 100% malathion hydrolysis and 36.2% fenchlorophos hydrolysis were observed, while in greenhouse drainage water, stored at pH 8.2 for 15 days, the degree of hydrolysis was 74.6% for malathion, 64.1% for dimethoate and 18.4% for actellic. These values agreed well with those calculated from the kinetic experiments. Figure 1; references 7: 6 Russian, 1 Western.
[39-12126]

UDC 633.95.028

CONTENT AND TASKS OF STUDIES OF ECOTOXICOLOGY OF PESTICIDES

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 10, Oct 81 pp 5-7

KOVDA, V. A., corresponding member, USSR Academy of Sciences and SOKOLOV, M. S., candidate of agricultural sciences, Institute of Agrochemistry and Soil Sciences, USSR Academy of Sciences

[Abstract] The increasing awareness of mankind of the need to maintain environmental quality is generally discussed, emphasizing the role of organizations such as UNESCO in attempts to evaluate environmental quality. The content of UNESCO subproject 9-b, "ecologic effects of the use of pesticides and other means of control of harmful organisms in continental and fresh water ecosystems" is discussed in general. The investigations within the framework of subproject 9-b

are generally dedicated to ecolological evaluation of the most effective methods of control of harmful organisms. This report does not present a detailed discussion of the content or scientific methodology of subproject 9-b, mentioning simply the two main themes: evaluation of the effects of the use of pesticides in the biosphere and evaluation of the effects of the general decrease in effectiveness of second generation pesticides due to the resistance of harmful organisms. The article has two main purposes: familiarization of Soviet readers with the existence of the problem, and condemnation of the US chemical industry for blind following of the profit motive regardless of ecological consequences. References 26: 21 Russian, 5 Western.
[43-6508]

UDC 632.95

NEW ACHIEVEMENTS IN STUDIES OF PESTICIDE CHEMISTRY

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 10, Oct 81 pp 8-12

MANN, JULIUS J., doctor, Department of Scientific Research, Zoecon Corporation, USA

[Abstract] A study is made of several approaches toward development of current-day pesticides: empirical synthesis and standard screening, synthesis of analogues and optimization of the relationship between activity and structure, modeling of natural products, biochemical design, biorational synthesis (e.g., chemical synthesis which gives insight to structure of natural compounds, e.g., juvenile hormones) and innovative screening. Each of these methods is described in general terms and examples of pesticides discovered by each method are mentioned. The author hopes that this brief outline of methods which can be used in the search for new pesticides will assist in the search for narrower-spectrum pesticides for use in the future.
[43-6508]

UDC 541.182/3:632.6/7

THEORETICAL PRINCIPLES OF OPTIMIZATION OF TECHNOLOGY FOR APPLICATION OF INSECTICIDE AEROSOLS

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 10, Oct 81 pp 12-18

KUTSENOGIY, K. P., candidate of technical sciences, Institute of Chemical Kinetics and Combustion, Siberian Branch, USSR Academy of Sciences

[Abstract] There is no theory presently capable of estimating the expected level of residual pesticides in plants, soil and atmosphere after aerosol application. This article studies a simplified block diagram of the application of a pesticide aerosol in order to arrive at a first approximation of the pesticide residues

created in various environmental strata. Selection of the minimum possible rate of application of pesticides by the aerosol method and the optimal droplet diameter can decrease the harmful aftereffects of pesticide usage on the global scale. Figures 7; references 45: 20 Russian, 25 Western.
[43-6508]

UDC 632.95.028

HYGIENIC STANDARDIZATION OF CHEMICAL SUBSTANCES IN SOIL AS MEANS FOR PREVENTING ENVIRONMENTAL POLLUTION

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 10, Oct 81 pp 19-21

GONCHARUK, Ye. I., doctor of medical sciences, PROKOPOVICH, A. S., candidate of medical sciences and SHOSTAK, L. B., Kiev Medical Institute

[Abstract] A brief history is presented of studies on the setting of norms for chemical substances in the soil in the USSR. The determination of the maximum permissible concentration of a chemical substance in the soil is based on several indicators of harmfulness: toxicologic, phytologic-accumulation, migration through air and water (considering surface runoff) and the general sanitary standards. Standardization is based largely on laboratory rather than field testing, using a limited number (generally 1) of soil types. The standardization of maximum permissible levels of chemical substances in the soil is one means of improving the ecotoxicologic situation of the environment, which goes far toward determining the state of health of the population. References 20: 19 Russian, 1 Western.
[43-6508]

UDC 632.95.028

SPECIFICS OF DECOMPOSITION OF DDT IN VARIOUS SOILS AS FUNCTION OF HYDROTHERMAL CONDITIONS

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 10, Oct 81 pp 29-34

CHEKAREVA, T. G., candidate of chemical sciences, GALIULIN, R. V., candidate of biological sciences, ANAN'YEVA, N. D., candidate of biological sciences, PERFILOVA, N. V., STREKOZOV, B. P. and SOKOLOV, M. S., candidate of agricultural sciences, Institute of Agrochemistry and Soil Science, USSR Academy of Sciences, ALIYEV, A. R., candidate of biological sciences, academician, Azerbaijan Academy of Sciences and ALIYEV, G. A., Institute of Geography, Azerbaijan Academy of Sciences

[Abstract] The history of the use of DDT in agricultural pest control is briefly outlined. Results are presented from studies of the decomposition of DDT in the soil and estimates are presented of the action of the preparation on soil microorganisms, produced under small-scale field experimental conditions with three

soil-moisture-content levels. The specimens were exposed in three altitude zones in Azerbaijan with different typical temperatures, using serozem and chernozem meadow-type soils. The results of determination of the actual and calculated characteristics of the dynamics of DDT loss in soil specimens are presented in tabular form. The experiments indicated that the DDT broke down quite rapidly with 66 to 99% relative moisture contents in the soil in the chernozem soil, while moisture content had much less influence on DDT breakdown rate in serozem soil. It was found that the total population of microorganisms in soil samples could not be used as a criterion for evaluating the rate of breakdown of DDT in soil samples. Figures 2; references 14: 4 Russian, 10 Western.
[43-6508]

UDC 632.95.028

HYGIENIC STANDARDIZATION OF METAFOS IN SOIL

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 10, Oct 81 pp 39-41

SPYNU, Ye. I., doctor of medical sciences, MOLOZHANOVA, Ye. G., candidate of biological sciences and IVASHINA, S. A., candidate of biological sciences, All-Union Scientific Research Institute of Hygiene, Toxicology, Pesticides, Polymers and Plastics

[Abstract] Materials are presented from determination of the hygienic standards for the content of metafos in soil. Metafos is a moderately persistent compound, remaining for weeks to months in plants and in the soil. The time of preservation of metafos in plants and in the soil in various regions in the nation varied from 3 weeks to 6 months. A content of metafos in the soil of 0.1 mg/kg can be considered safe, since its migration into contacting objects occurs in quantities not exceeding the permissible hygienic standards for this substance in these media. The MPC for metafos in soil is therefore recommended at 0.1 mg/kg. References 5 Russian.
[43-6508]

UDC 632.95.028

TOXICITY OF CHEMICAL SUBSTANCES FOR HYDROBIONTS

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 10, Oct 81 pp 41-43

BELYAVSKAYA, L. I., BELYANINA, S. I., YEGOROVA, G. G., KUZ'MINA, K. A., SIGAREVA, L. Ye. and FEDOTOVA, Ye. A., Saratov Medical Institute

[Abstract] The specifics of toxic effects of certain pesticides and fertilizers (individually and mixed) on aquatic organisms was determined. Pesticides included chlorophos, metafos and hexachlorane, fertilizers included ammonium nitrate and double superphosphate. The test objects included the crustaceans Gammarus pulex, Asellus aquaticus, the leaches Erpobdella octoculata, larvae of Chironomus thummi, Ch. plumosus. The studies were performed under acute and subacute experimental conditions using both specimens gathered in nature and laboratory cultures of Chironomids. It was found that the toxicity of the pesticides and fertilizers varied depending on combinations. As a rule, the toxic effects of combinations exceeded the sum of the effects of each chemical individually. Tests allowing judgements to be made concerning the toxicity of substances for aquatic life forms should include studies of the influence of the preparations on reproduction, development and the condition of the hereditary apparatus. References 8 Russian. [43-6508]

UDC 632.95.028

STABILITY OF PESTICIDES IN WATER

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 10, Oct 81 pp 43-45

BROCHINSKIY, K. K., doctor of medical sciences, All-Union Scientific Research Institute of Hygiene, Toxicology, Pesticides, Polymers and Plastics

[Abstract] Results are presented from a study of the dynamics of disappearance of pesticides in model bodies of waters containing no aquatic organisms. The pesticides were introduced to the water once. Both chemically pure compounds and commercial forms of preparations were used. Solvents were added as necessary if the solubility of the compounds in water was insufficient to allow full dissolution. Water samples were taken before and immediately after introduction of the pesticides, as well as after 1, 3, 12 and 24 hours; 3, 5, 10 and more days up to 113-150 days. The specimens were analyzed by TLC. The specimens tested are listed and the rates of decrease in content in the water specimens are described. Most pesticides presently used are highly stable in water. References 4 Russian. [43-6508]

UDC 632.95.028

ACCUMULATION AND MIGRATION OF PERSISTENT PESTICIDES UNDER SLOW RUNOFF CONDITIONS (RIVER DELTA - RESERVOIR)

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 10, Oct 81 pp 45-47

KOMAROVSKIY, F. Ya., candidate of biological sciences, MASLOVA, O. V., PISHCHOLKA, Yu. K. and SHEBUNINA, N. A., Institute of Hydrobiology, Ukrainian Academy of Sciences

[Abstract] Results of studies performed in the delta of the Danube River indicate that DDT accumulates an order of magnitude higher in concentration along each link upwards in the trophic chain. Systematic studies of the content of persistent pesticide residues in common species of commercial fish in reservoirs and the Danube delta have shown that the pesticides concentrate primarily in the fatty and brain tissues (DDT) with DDD and DDE accumulating primarily in the internal organs. The muscle tissues showed the lowest concentrations of the pesticides. Model experiments have established the principles of distribution of persistent pesticides in the organs and tissues of aquatic organisms of various trophic levels and allowed imitation of accumulative toxicosis and specifics of accumulation of DDT and its metabolytes for various aquatic species. References 3: 1 Russian, 2 Western.
[43-6508]

UDC 632.95.028

ACCUMULATION AND MIGRATION OF ORGANIC COMPOUNDS OF CHLORINE IN RESERVOIR ECOSYSTEM

Moscow KHIMIYA V SEL'SKOM KHOZYAYSTVE in Russian No 10, Oct 81 pp 47-48

SHCHERBAKOV, Yu. A., State Scientific Research Institute of Lake and River Fisheries, Saratov

[Abstract] A study was made of the accumulation and migration in reservoirs of four persistent chlorinated organic compounds: HCCH, DDT, DDD and DDE. The studies, performed in a number of bodies of water, showed that the compounds were found in quantities of 0.15 gm/ℓ in the surface layer to 0.25 mg/ℓ along the bottom. Seasonal variations in the content of the pesticides were observed, the highest concentration in the water and benthic deposits observed in the summer (season of maximum utilization). The accumulation of the pesticides in fish as a function of age was studied. The four substances studied were found to migrate in the system of the bodies of waters studied along a regular chain: surface runoff to water to bottom deposits to invertebrates to vertebrates. These substances are highly stable and toxic for aquatic organisms, have clear ability to migrate through the aquatic ecosystem and accumulate in bottom deposits as well as aquatic organisms, altering and disrupting the equilibrium of aquatic biocenoses.
[43-6508]

UDC 547.584.547.551

SEARCH FOR POTENTIAL PESTICIDES AMONG N-SUBSTITUTED PHTHALIMIDES

Tashkent UZBEKSKIY KHIMICHESKIY ZHURNAL in Russian No 4, Jul-Aug 81
(manuscript received 11 Feb 81) pp 59-61

MAKSUDOVA, F. N., RASULEVA, D. Kh. and SAFAYEV, A. S., Tashkent Institute of Irrigation and Mechanization of Agriculture

[Abstract] N-substituted phthalimides are protective fungicides which have not been studied as anti-wilt preparations. The authors synthesized several N-substituted phthalimide derivatives for this purpose. Phthalic anhydride was interacted with substituted aromatic amine with heating of equimolar quantities of the reagents in glacial acetic acid. The yields of the reaction products depend on the basicity of the aromatic amine. To determine the variation and biologic activity as a function of structure of the compounds synthesized, a number of new N-aryl phthalimides were obtained, containing several atoms of chlorine in the phthalimide portion of the molecule, from polychlorophthalic anhydride and the corresponding aromatic amine; yields varied from 20 to 56%. Properties of aryl phthalimides are presented in tables. References 4 Russian.

[35-6508]

PETROLEUM PROCESSING TECHNOLOGY

UDC 665.666.62:621.384.8

STUDY OF NITROGENOUS BASES OF CRUDE OILS BY MASS SPECTROMETRY

Moscow NEFTEKHIMIYA in Russian Vol 21, No 5, Sep-Oct 81
(manuscript received 20 Oct 80) pp 748-754

GONCHAROV, I. V., ZHIL'TSOV, N. I. and LAZAREV, A. S., Western Siberian Scientific Research Geologic Prospecting Petroleum Institute

[Abstract] This work is a continuation of earlier investigations of the nonhydrocarbon components of petroleum and involves a study by mass spectrometry of the composition of the nitrogenous bases extracted from crude oils. The objects of the study included specimens from regions differing greatly both in composition of petroleum and in deposition conditions. The nitrogenous bases were separated by extraction in a 10% HCl solution. The content of low-molecular-weight nitrogenous bases, particularly quinolines, was rather high in the oldest oil. This same petroleum contained the minimum content of acridines. Most of the concentrates of nitrogenous bases are compounds in the quinoline and acridine series, pyridines being contained in much smaller quantities. The total content of nitrogenous bases and their structural-group composition vary over broad limits both in petroleums from different deposits and among petroleums from the same deposit. Figure; references 19: 18 Russian, 1 Western.
[44-6508]

UDC 665.753.2:542.943

NATURAL REACTIVE FUEL OXIDATION INHIBITORS

Moscow NEFTEKHIMIYA in Russian Vol 21, No 5, Sep-Oct 81
(manuscript received 11 Nov 80) pp 718-724

KOVALEV, G. I., BORISOVA, L. K., GOGITIDZE, L. D., KURANOVA, V. I. and VESELYANSKAYA, V. M.

[Abstract] A study is made of the inhibiting effect of natural antioxidants and they are compared with inhibitors used in hydrogenization fuels. The natural inhibitors are used in straight-run fuels, which contain strong inhibitors, inferior to ional in the effectiveness of inhibition in hydrogenization fuels, but superior to ional in capacity (at a concentration of 0.004 mass %). These

inhibitors break the oxidation chain and break down hydroperoxides. Sulfur compounds such as sulfides, disulfides, mercaptans and thiophanes increase the rate of formation of chains in the oxidized fuel and break down hydroperoxide by a molecular mechanism; the products of oxidation of the sulfur compounds are effective inhibitors. Figures 3; references 6 Russian.
[44-6508]

POLYPROPYLENE PRODUCTION AT TOMSK CHEMICAL PLANT

Moscow EKONOMICHESKAYA GAZETA in Russian No 27, Jul 81 p 9

[Article: "Prior to Startup"]

[Text] As is known the first tons of Tomsk polypropylene were produced as a result of testing the equipment. But the main exam still remains. Construction of the entire complex of the first unit of the plant must be completed and polypropylene production must be brought up to design capacity within compressed deadlines. And this is many hundreds of kilometers of underground and surface communications lines, production pipelines, cable networks, industrial installations of unique capacity and computer equipment, an enormous boiler room and large electric power facility, powerful pumping and purification installations.

The electric-arc welding flames were extinguished recently at many facilities. The last work was completed by the installers on the finished product warehouse and the catalyst production buildings. The adjusters and operators are now hosts here.

"We set ourselves a task--to bring the equipment to full capacity twice as fast as the normative deadlines even at the beginning of the second six months," says the polypropylene production chief G. Sosunov.

"We work in three shifts according to a sliding schedule and we combine the starting-adjusting work with installation work. All the main assemblies and production networks have been brought up to operating conditions."

The builder brigades of L. Kungurtsev and A. Voluyskiy, the installer brigade of B. Burmatov and the shift of operators under the supervision of V. Kozlov achieved the best results in the socialist competition during the final phase.

It is planned to produce an additional 20,000 tons of valuable chemical product used to produce parts for ships and aircraft, machine tools and domestic appliances, pipelines and national consumer goods this year due to accelerated assimilation of design capacities.

6521
CSO: 1841/25

FORESTRY ACADEMY INVENTS FOAM PLASTIC WITH WOOD FILLER

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 29 Oct 81 p 4

[Article: "Foam Plastic With Shavings"]

[Text] Foam plastic possesses good consumer properties: It is light, and it is easily worked. Were its mechanical properties any better, it could become a worthy rival to wood in many industrial sectors. It was with this purpose that specialists of the Forestry Academy imeni S. M. Kirov developed a new material: As foam plastic it is not anything new, but it is different in that it is reinforced with wood fibers. Owing to this filler, the new material has no fear of high shock loads. It also retains its previous qualities, such as being low in density, easily worked and nonflammable.

11004
CSO: 1841/51

UDC 678.675.033:66.095.264

PRODUCTION OF FILLED POLYAMIDES WITH IMPROVED PROPERTIES

Moscow PLASTICHESKIYE MASSY in Russian No 10, Oct 81
(manuscript received 9 Jun 80) pp 12-14

GORBUNOVA, Ye. V., DEYEV, Yu. S., KULICHIKHIN, S. G. and RYABOV, Ye. A.

[Abstract] Studies were performed which indicated that polymerization, in the system studied, is a first order reaction with respect to the content of the monomer. The effective activation energy of polymerization of caprolactam and dodecalactam is ~84 and 126 kJ/mol. The molecular mass of the polymer formed increases continually with continued polymerization. The physical and mechanical properties of materials thus obtained are significantly higher than those of composites produced by introduction of the same filler to a prepared polymer by extrusion. The method of synthesis of polyamides studied has a number of technological advantages over the hydrolytic method (no elevation of pressure, single-stage nature of operations, short duration of process, lack of waste water) and produces a polymer with good strength and wear resistance. Figures 3; references 2: 1 Russian, 1 Western.
[34-6508]

UDC 678.744.342:66.095.2

MIGRATION POLYMERIZATION OF N, N'-HEXAMETHYLENEBISMALEINIMIDE AND 4, 4'-DIAMINODIPHENYLMETHANE IN MELT

Moscow PLASTICHESKIYE MASSY in Russian No 10, Oct 81 pp 14-16

SUSLOV, A. P., DOLMATOV, S. A., DEYEVA, V. S., LEVSHANOV, V. S., ISAKOV, I. V. and YUDINA, L. V.

[Abstract] A study was made of the kinetics of migration polymerization of the compounds mentioned in the title at a molar ratio of 2:1. Before use, the initial components were dried for two hours in a vacuum at 40°C. Polymerization is performed with agitation in a glass flask in a thermostat. Samples were rapidly cooled to room temperature and analyzed. The kinetics of polymerization was studied by measuring the content of primary amino groups, of the first component and the gel fraction. The results of studies of the kinetics and IR spectroscopy indicate that the polymer produced has the structure of PBMIA, with just one hydrogen atom of the primary amino group reactings. The IR spectrum of the polymer contains an imide ring, as indicated by the carbonyl group absorption at 1780 and 1710 cm^{-1}, but does not show the absorption band of the maleinimide double bond. An absorption band at 1160 cm^{-1} is caused by the valent oscillations of the C-NH group. Characteristics of the PBMIA produced are as follows: bending fracture stress 94/33 MPa, bending modulus of elasticity 2100/1250 MPa, impact toughness

12/9 kJ/m^2, dielectric loss angle tangent at 1 KHz $1.8\cdot10^{-3}/1.2\cdot10^{-2}$, dielectric strength at 1 KHz 3.1, specific volumetric resistivity $10^{16}/10^{12}$ohm·cm, dielectric strength 42 kV/mm (20°C/180°C. Figure 1; references 10: 6 Russian, 4 Western.
[34-6508]

UDC 678.742.2:66.095.2

PRODUCTION OF LOW DENSITY POLYETHYLENE BY LOW PRESSURE METHODS

Moscow PLASTICHESKIYE MASSY in Russian No 10, Oct 81 pp 17-18

BAULIN, A. A., RODIONOV, A. G., ANDREYEVA, I. N., NALIVAYKO, Ye. I., GOL'DENBERG, A. L. and IVANCHEV, S. S.

[Abstract] A study is made of the possibility of producing a copolymer of ethylene with butene-1 or hexene-1 over a catalytic system $TiCl_4/MgO + Al(C_2H_5)_3$ in a hydrocarbon solvent; properties of the copolymers formed are compared with those of high pressure polyethylene. The catalytic system used provides a good yield of copolymer of ethylene with butene and hexene per gram of transition metal at low pressure. The copolymers produced contain 0.8-5.1 mol.% α-olefin and have properties which agree well with the characteristics of the basic types of high density polyethylene according to the state standard. The results indicate the possibility of producing low density polyethylene by a low pressure method using known catalysts. References 4: 2 Russian, 2 Western.
[34-6508]

UDC 678 675-13:66.095.2

SYNTHESIS OF COPOLYMER OF ω-DODECALACTAM AND ε-CAPROLACTAM

Moscow PLASTICHESKIYE MASSY in Russian No 10, Oct 81 (manuscript received 27 Jun 80) pp 18-19

PAVLOVA, A. Ye., DOBROKHOTOVA, M. K., ARTSIS, Ye. S. and FRUNZE, T. M.

[Abstract] Results are presented from a study of the influence of water on the process of copolymerization of ω-dodecalactam and ε-caprolactam with a molar ratio of the initial monomers of 50:50. Judging from the kinetic curves, the reaction of consumption of the monomers during copolymerization has a definite induction period, the duration of which depends on the initial content of water, varying from 60 minutes, with a water content of 1%, to 15 minutes with a water content of 5%. The initial content of water also influences the course of the process, reducing the time of achievement of total equilibrium of conversion from 35 hours with 1% water content to 14 hours with 5% water content. Total conversion of the monomers is similarly influenced. Figures 2; references 5: 4 Russian, 1 Western.
[34-6508]

UDC 678.5.004(100)

USE OF POLYIMIDE MATERIALS IN FOREIGN AVIATION AND SPACE TECHNOLOGY

Moscow PLASTICHESKIYE MASSY in Russian No 10, Oct 81 pp 23-30

MIKHAYLIN, Yu. A.

[Abstract] This review of the foreign literature (primarily American) discusses the production and utilization of polyimide materials in western air and space technology. The products are discussed by types: films, liquids, fibers, binders, honeycomb plastics and adhesives. In each case, specific brand names are mentioned, their properties and typical uses given, though generally without discussing specific hardware or projects. References 123: 2 Russian, 121 Western.
[34-6508]

UDC 547.31:542.952:542.97

GEL-IMMOBILIZED CATALYTIC CODIMERIZATION SYSTEMS FOR OLEFINS CONTAINING ORGANOPHOSPHORUS LIGANDS

Moscow NEFTEKHIMIYA in Russian Vol 21, No 5, Sep-Oct 81
(manuscript received 4 Nov 80) pp 694-697

POTAPOV, G. P., OSIPOVA, N. P., VAYZI, Z. S., PRUDNIKOV, A. I., SMETANYUK, V. I. and KABANOV, V. A., Syktyvkar State University imeni 50th Anniversary of the USSR; Institute of Petrochemical Synthesis imeni A. V. Topchiyev, USSR Academy of Sciences

[Abstract] A study is made of codimerization of ethylene with propylene in the presence of gel-immobilized catalytic systems containing various organophosphorus ligands. Tables present examples of the carriers synthesized and some of their characteristics. The nickel-containing gel-immobilized metal complex catalytic systems synthesized contain phosphine and phosphite macroligands. The primary components of the pentene fraction of codimerization products of ethylene with proplyene are trans and cis-2-pentene and 2-methyl-2-butene. Figures 3; references 4 Russian.
[44-6508]

UDC 536.468+678.674'524'420

MODIFIED POLYETHYLENETEREPHTHALATE WITH REDUCED FLAMMABILITY

Minsk IZVESTIYA AKADEMII NAUK BSSR: SERIYA KHIMICHESKIKH NAUK in Russian No 5, Sep-Oct 81 (manuscript received 12 Apr 79) pp 88-92

LOPATIK, D. V., BONDAREVA, O. M., PROKOPCHUK, N. R., TUCHKOVSKAYA, A. V., OSIPENKO, I. F., KOVALEV, V. I., PATSEY, V. F. and PROKOPCHIK, N. I., Institute of Physical and Organic Chemistry, Belorussian Academy of Sciences, Mogilev Machine Building Institute

[Abstract] Joint polyesterification of terephthalic acid (PETP) and 2,5-dibromoterephthalic acid (DBTA) by ethyeleneglycol is carried out and the properties of the modified PETP produced are studied. The polyesterification reaction was performed in a melt using condensation test tubes or a laboratory autoclave. As the quantity of comonomer links is increased a decrease in the viscosity of the copolyester is observed, with an increase in the intensity of coloration of the polymer. It is assumed that partial decomposition of the bromine-containing comonomeric acid occurs in the process of copolycondensation. The use of the DBTA in the joint polycondensation process with terephthalic acid and ethylene glycol produces fibrous materials with reduced flammability. The fibers produced using 3 mol.% of DBTA have good mechanical strength, increased thermal stability, improved ease of dyeing and reduced flammability in comparison to fibers based on unmodified polyethylene terephthalate. References 9: 4 Russian, 5 Western.
[33-6508]

RADIATION CHEMISTRY

UDC 621.039.54:621.039.526

CURRENT STATUS OF INVESTIGATIONS OF NUCLEAR FUEL ELEMENT REPROCESSING WITH FAST NEUTRON REACTORS

Leningrad RADIOKHIMIYA in Russian Vol 23, No 5, Sep-Oct 81
(manuscript received 3 Nov 80) pp 743-752

ZEMLYANUKHIN, V. I., NIKIFOROV, A. S., NOVOSELOV, G. P., PRUSAKOV, V. N.,
SKIBA, O. V., TSARENKO, A. F. and SHMIDT, V. S.

[Abstract] This is a review type presentation which was delivered at the 5th Symposium on Reprocessing of Irradiated Fuel, held in Czechoslovakia in March 1981. Expansion in the construction of nuclear electric power plants based on thermal and fast neutrons brings to the forefront the problem of regeneration of nuclear fuel, especially for the fast neutron reactors. There are two basic methods of recovery, an aqueous or extraction method and a non-aqueous or gas-fluorination method. The aqueous methods are currently more practical inasmuch as they are applicable to thermal neutron reprocessing and have already been used extensively in the past. There are certain aspects of this method connected with increased levels of plutonium in the material being reprocessed and with increased levels of the breakdown products of some impurities, the author reviews these. The non-aqueous methods discussed in this paper include the thermal isolation of irradiated fuel elements, oxidative recrystallization of fast neutron reactor fuel, fluorination coupled with separation of the fluorides formed, and the salting out of the remnants of the fluorination process and of the plutonium containing sorbents. References 75: 68 Russian, 7 Western.
[47-7813]

UDC 543.43:621.039.542.342

DETERMINATION OF FLUORINE AND CHLORINE IN MIXED URANIUM-PLUTONIUM OXIDE FUEL AND PLUTONIUM DIOXIDE

Leningrad RADIOKHIMIYA in Russian Vol 23, No 5, Sep-Oct 81
(manuscript received 25 Jul 80) pp 753-759

YELINSON, S. V., ZEMLYANUKHINA, N. A., PAVLOVA, I. V., FILATKINA, V. P. and
TSVETKOVA, V. T.

[Abstract] Fluorine and chlorine have a tendency to essentially damage the anticorrosive properties of heat-producing elements. The nuclear fuel itself

may be the source of these halides. Therefore, content of F^- and Cl^- in nuclear fuel must be strictly regulated. This paper describes the investigation of optimal conditions for pyrohydrolysis of chlorides and fluorides found in uranium salts. After trapping HCl and HF in water or base, their concentration can be determined by colorimetric, photometric or spectroscopic methods. It was found necessary to pulverize the specimens before subjecting them to pyrohydrolysis. The optimal conditions for the process were: duration - 30 min, temperature - 1100°C. Under these conditions practically no uranium or plutonium was found in the condensates with F and Cl. Either air or nitrogen could be used as the gas carrier. No activators were needed for completeness of this process. Independent analysis showed that the pyrohydrolytic method assures complete recovery of these elements. The threshold of sensitivity is $10^{-4}\%$ (F) and $5 \cdot 10^{-4}\%$ (Cl) for 0.2 g samples, or $6 \cdot 10^{-5}\%$ (F) and $10^{-4}\%$ (Cl) for 1 g samples of the fuel or plutonium dioxide. Figures 4; references 15: 7 Russian, 8 Western.
[47-7813]

RUBBER AND ELASTOMERS

UDC 678.4.063.01:539.24

CROSS LINKING OF ELASTOMER PHASES IN SULFUR VULCANIZATION OF RUBBERS BASED ON SKI-3+SKMS-30ARK RAW RUBBERS

Moscow KAUCHUK I REZINA in Russian No 10, Oct 81 (manuscript received 10 Nov 80) pp 21-24

SHVYDKAYA, N. P., SHUMANOV, L. A. and LYKIN, A. S., Scientific Research Institute of the Tire Industry

[Abstract] A study was made to determine whether there are differences in the kinetics of vulcanization of an individual raw rubber and its elastomer phases and to determine the extent to which these differences are related to the initial content of vulcanizing agents and to their redistribution in the process of vulcanization. The kinetics of cross linking of individual raw rubbers of the types mentioned in the title and their elastomer phases in the process of sulfur vulcanization was studied using a mixture consisting of the following components (mass parts per 100 mass parts of raw rubber): zinc oxide 5.0, stearic acid 2.0, sulfur 0.5-3.0 and sulphenamide C 0.5-5.1. The specimens were vulcanized in an electric press at 2.5 MPa, 143°C. According to the data produced, in the optimum regimen the ratio of sulfur to sulphenamide C in SKMS-30ARK is 1.7:0.6, in the SKMS phase (50:50) it is 1.57:0.7, in the SKMS (80:20) phase it is 1.51:0.78. Consequently, the content of sulfur in the SKMS-30ARK phase decreases, while it increases in the SKI-3 phase. Whereas the sulfur:sulphenamide C ratio in the SKI-3 component upon introduction to the mixture is 1.7:0.6, in the SKI-3 (80:20) phase the content of sulfur increases to 1.74, to 1.82 in the SKI-3 (50:50) phase. This indicates that since the kinetics of cross linking of SKI-3 and SKMS-30ARK differ significantly, upon 40 minute vulcanization SKI-3 cross links completely, while the cross linking of SKMS-30ARK is just beginning. The differences in the kinetics of vulcanization of individual raw rubbers and their elastomer phases can thus be explained on the basis of differences in solubility of sulfur and accelerator in the raw rubbers. Figures 4; references 7: 5 Russian, 2 Western.
[46-6508]

CREATION AND INDUSTRIAL INTRODUCTION OF MOTOR VEHICLE TIRES MADE WITH DOMESTIC RAW RUBBER

Moscow KAUCHUK I REZINA in Russian No 10, Oct 81 pp 62-63

YEVSTRATOV, V. F.

[Review of "Sozdaniye i promyshlennoye vnedreniye avtomobil'nykh shin s rezinami iz otechestvennykh sinteticheskikh kauchukov"]

[Abstract] (The reviewed document has received a prize from the USSR Council of Ministers; Yevstratov is making background comments.) Even the best synthetic rubbers are not substitutes for natural rubber. The difficulty of the problem of utilizing finished rubber goods based on synthetic rubber in the domestic tire industry has increased with the increase in the scale of transportation operations in areas such as the Soviet far north, where extreme cold adds to the naturally rough operating conditions there encountered. A summary is presented of scientific research undertaken to support successful application of synthetic raw rubber in the domestic tire industry in the Soviet union in recent years. Studies include refinement of requirements for technical conditions of rubber; development of new principles of design of chemical formulation of tire rubber; creation of the theoretical principles of chemical modification of rubber mixtures in the various stages of their manufacture; improvement of the elastic properties over broad temperature intervals and fatigue characteristics of vulcanized rubber formulas; the search for an assortment of basically new materials for the manufacture of tires and organization of their industrial production; development of technological processes using new methods of mixing and manufacture of rubber materials; and creation of specialized machines and devices for these new processes and materials. It should be noted that this review simply lists the areas of study discussed in the book reviewed, and gives no details on actual research work performed. [46-6508]

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